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THE

SANITARIAN,

A MONTHLY MAGAZINE

DEVOTED TO THE

PRESERVATION OF HEALTH, MENTAL AND PHYSICAL CULTURE.

VOLUME XXXVII., JULY TO DECEMBER.

A. N. BELL, A.M., M.D., Editor.

T. P. CORBALLY, A.M., M.D., HARRY KENT BELL, M.D., } Associate Editors.

BROOKLYN, N. Y.: A. N. BELL,
1896.

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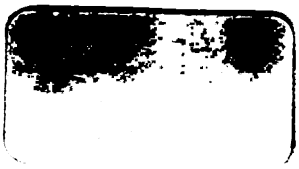

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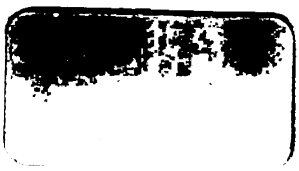

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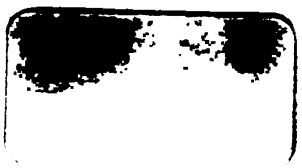

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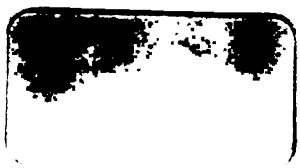

the average number who use a bath is only 546, pertinently suggests the question: Should not every lodger in such houses be compelled by sanitary ordinance to bathe before retiring? That the mere provision of water and a tub is not always a sufficient inducement for a cleansing bath is evidenced by the replies of some of the patrons of lodging houses, when asked their opinion of the bathing accommodations. The following are among the reasons given for not using the baths in the houses where they sleep:

C. D.—"The tubs can only be used from 5 A. M. to 7 A. M."

J. M.—"The shower baths are the best for taking the dirt off a fellow."

R. G.—"The tubs are never cleaned out, from the appearance of them."

T. W.—"Can't get a good wash without hot water."

W. B.—"The tubs are only an advertisement for the house; they are not clean."

F. S.—"Find too many old medicine bottles for my taste."

P. M.—"Not enough hot water."

J. L.—"Do not like bath tubs."

B.—"Bad enough to sleep in a lodging house without using their tub baths."

There is a special feature in the construction of the proposed Free Public Bath Houses to which I desire to direct attention particularly, it being for the first time adopted in this country in any public bath—namely, the provision for the spray or rain bath only for cleansing purposes. As these baths are not intended in any sense as simply pleasure resorts—except in the sense of the pleasure experienced upon emerging from them in a thoroughly clean condition—the question naturally arises, why not provide swimming baths in connection? The answer is, these baths are for cleansing purposes only, and by the use of the individual spray bath, a degree of personal cleanness is attained that cannot be secured by any other means, so thoroughly, so efficiently, so quickly and so economically. Only about one-tenth of the quantity of water used in ordinary bath tubs in each case is necessary. The important desideration of thoroughly cleansing the whole person with the continued application of clear running water only—all freely running away as fast as it becomes soiled—is secured. The use of soiled water, as in the ordinary bath tub, is entirely avoided; and the labor of cleansing the bath tub after each use, as a sanitary necessity, is dispensed with. By this system bodily purification is obtained, a

healthful stimulus is imparted to the nerve radicals of the cutaneous surface, and health promoted.

There is no necessity to illustrate the beneficial effects of baths by reference to the universal examples, held in such esteem, by the ancient Egyptians and Romans, whose luxurious public baths are matters of history, but upon which these public rain baths are an improvement.

That the system of public spray or rain baths, about to be thrown open to the hitherto great unwashed portion of our population, is a great improvement over those ancient systems of plunge and swimming baths for the promotion of personal cleanliness and health, is beyond question. But upon this point I must forbear to elaborate. The experience of every one accustomed to bathing in the household bath tub, or in any of the numerous bathing establishments scattered throughout the city, whether in single bath tubs or in swimming or plunge baths, with a moment's thought, cannot but be a convincing argument of the infinite superiority in various aspects of the spray or rain bath system.

Salt water bathing, both as a healthful and pleasure giving exercise, provided it is taken at the seaside, or where there is no sewage contamination, is unquestionably of great utility and promotive of health, and by no means to be disparaged. But this luxury is not at all seasons possible. Hence, *the year-round free public baths of hot and cold water* are a virtual necessity to the maintenance of the public health in every dense population, but most of all to that portion of the community who occupy tenement houses.

PUBLIC COMFORT STATIONS.

It may be briefly stated that the construction of two of these only is now provided for, as initiative. One is to be located at the southern end of the City Hall Park, the other at the small triangular park located at the junction of Broadway, Sixth avenue, Thirty-second and Thirty-third streets.

Both of these will be underground, arranged for both sexes, with entirely separate approaches, and constructed and cared for with the purpose of making them attractive, and useful models for others to be located at most accessible points throughout the city. The necessity for the provision of public comfort stations in various parts of the city hardly needs argument. In the great cities of Europe they are liberally provided. This municipal provision for the comfort and welfare of their citizens is a standing disgrace for our great civic neglect.

Private enterprise has already seized upon this great public necessity as a means for greater emolument; the saloons and greater mercantile marts where multitudes daily assemble have already introduced with much elaboration and attractiveness these public comfort conveniencies, and in such "toilet rooms" are considered an important and indispensible feature.

The general consensus of observing and thinking minds is, that New York should lose no time in making this public provision. The multitude of employees in every department, whose outdoor occupations compel them to resort mainly to the liquor saloons, where temptation leads them to neglect their duties, or offers a ready excuse for dereliction, is a great source of annoyance and trouble to the heads of such departments, especially of the great Public Works Department, the Street Cleaning Department, and not the least, the Police Department, to say nothing of the greater public of our citizens of both sexes, in their pursuits of daily avocations, away from their homes.

All thinking minds, when viewing these subjects from the standpoints of public necessities, civic policy and the vital sanitary and hygienic welfare of the community at large, cannot but concur in the conclusion that the time has arrived when it is almost criminal longer to delay the providing of both Free Public Baths and Free Public Comfort Stations.

Consider for a moment the thousands of females, employed the day long, day after day, in the great caravansaries of trade, in the multitude of offices in all parts of the city, away from their homes, located at their typewriting machines in low and lofty buildings, in shops, stores and manufactories, whose sufferings are silently endured until health is undermined, simply for the want of these public comfort stations. These are not exaggerations, but facts, easily ascertained. It is the exception to find such conveniences provided in such mentioned places for female employees. Great business houses, factories, shops and sky scraping offices filled with these indispensable toilers suffering absolute torture for hours because of the parsimony or indifference of the investors, whose main object seems to be to utilize every foot of space for business purposes, utterly ignoring the fact that scarcely any of these offices are not without female employees, whose modesty compels them to be uncomplaining sufferers. Their health is in jeopardy, and sooner or later overtaxed nature yields to prolonged ill health and misery. As one of the medical profession, cognizance of these evil effects has not

infrequently been observed, and it would seem to be a dereliction to maintain silence with reference to so important a health question.

The great migratory public of both sexes, who daily and hourly throng our city, from suburban residences for purposes of business or pleasure, are seriously incommoded by the absence of public comfort stations, and are compelled either to resort to drinking saloons or the great dry goods houses, often at great inconvenience or positive injury.

These provisions have become a positive and great necessity that should not be longer overlooked. The demand for them is imperative, and this great city cannot afford to ignore the fact, or afford to be so far behind other enlightened communities in providing these necessary healthful appendages.

The rapid advancement of sanitary knowledge demands the practical application of these important provisions.

P. S.

EDITOR SANITARIAN :

If not too late, please add the following abstract af a letter, just received, to my paper on Baths, etc., from ROBERT J. ROBERTS, Esq., Physical Director, Young Men's Christian Association, Boston.

MOREAU MORRIS.

New York, June 30, 1896.

"As far as I know, I invented and named the Roberts' Rain Shower. I had Lumb, the Plumber on Spring Lane, of our city, make them for me. I got the idea of the rain shower from a lecture written by the father of the old doctor Hitchcock in 1825. He stated that the fall of water on the head was dangerous, so he advised them to use a cap shaped like a dunce cap. This they were advised to wear on top of their heads when they took the shower bath.

"The thought came into my head and the different ring-shaped rain shower baths were the result. I used these in 1883, in our, then, new gymnasium, in our present building. They were to be used at different heights and from and in different positions, so as to have a different action on the skin. The different heights were 8, 7½, 7, 6½ and 6 feet. The straight and curved needle was to be used from the wall, with a projecting group and the shower of spray jets, the same as we now have, with drainage from the floor right under the overhead rain-shower. The sizes of the rings vary from 18 to 24 inches in diameter. The holes in them are about as big as a large sewing needle and are about one inch and

a half apart, so that when the water runs like rain the shower comes down straight, but when it is put on in full force it drives inward, somewhat funnel-shaped. The old rose-shower bath was in common use even back in 1825."

Also of a letter from Dr. Luther Gulick, of the Physical Department of the International Young Men's Christian Association Training School of Springfield, Mass., who says: *** That the first gymnasium among our Young Men's Christian Associations was that of Twenty-third street, branch New York city, which was started in 1869.*** The introduction of needle baths was about ten years ago.

There is also an account in the "Young Men's Era," of first needle baths used in Baltimore, 1885 or 1886, in the Baltimore Natatorium.

SANITARY BRUSHWOOD PICKED UP IN EUROPE.

By C. W. Chancellor, M. D.

No. VIII.

Movement of Population in France.

France is face to face with a perplexing social problem. Political economists, statesmen and journalists are discussing in a serious spirit the languishing condition of the population, which year by year is decreasing by thousands. Among the contributing causes of the evil, one of the most obvious is the emigration of population from the provinces to the large cities, which increases, temporarily at least, the number of inhabitants of such cities, but in the end works an incalculable injury to the State.

Statistical data, the first step in the elaboration of social science, show that this domestic emigration is becoming every year more and more considerable and dangerous to the body politic. Borrowing from a French report, here I give, as the groundwork of the statements to follow, a statistical table showing the movement of population in ten principal cities of France, for the quinquennial periods between 1880 and 1890.

VILLES	1881	1886	1891
	HABITANTS	HABITANTS	HABITANTS
Paris	2.269.023	2.344.550	2.447.957
Lyon	376.613	401.930	438.077
Marseille.	360.000	376.143	403.749
Bordeaux	221.305	240.582	252.615
Lille	178.140	188.272	201.211
Toulouse.	140.289	147.617	149.791
St-Etienne	123.813	117.875	133.443
Nantes...	124 319	127.482	122.750
Le Havre.	105.867	112.074	116.365
Rouen....	105.906	107.163	112.352

It will be observed that the population of Paris increased in ten years only 178,934; that of Lyons 61,464; that of Marseilles 43,749; that of Bordeaux 31,110; that of Lille 23,069; that of Saint-Etienne 9,630; that of Havre 10,502; that of Rouen 6,442, whilst that of Nantes diminished 1,569. These figures, coupled with other facts to be given, will serve to show, with some precision, how much the increase has been due to immigration and how much to natural accretion. The last census reports, covering the quinquennial period from 1885 to 1891, show the excess of births or deaths, as the case may be, in these ten cities during the period referred to:

For Paris the excess of natality was.....	26,997
For Lyon the excess of mortality was.....	4,097
For Marseilles the excess of mortality was...	1,204
For Bordeaux the excess of mortality was...	2,360
For Lille the excess of mortality was.....	409
For Toulouse the excess of mortality was....	4,548
For St.-Etienne the excess of natality was...	984
For Nantes the excess of mortality was.....	2,337
For Havre the excess of natality was.....	632
For Rouen the excess of mortality was.....	2,583

Social statists reckon that in a normal condition of population, in all civilized countries, the proportion of births in a community should be from 10 to 15 per cent greater than the deaths; but it appears from the foregoing table that in France, one of the most enlightened, reasoning and philosophical nations known to civilization, there are only three of the principal cities of the country, viz., Paris, Saint-Etienne and Havre, where the birth rate exceeds the death rate; and in regard to Paris, it is necessary to remark, many children born there are of foreign parentage, temporarily sojourning in the city, and others, especially during the summer months, are sent to the provinces, or elsewhere, to be nourished and raised, consequently many deaths among those born in the city occur outside, and thus the comparatively small excess of births over deaths in this city is practically still further reduced. In fifty-eight cities of France, with more than 30,000 inhabitants each, the death rate has exceeded the birth rate in at least fifty of the number.

The decrease of births during the decennial period ending December 31st, 1890, was for Paris 2.6 per one thousand of population; for Lyon 3.2; for Marseilles 0.5; for Bordeaux 0.8; for Lille 4.3; for Toulouse 2.9; for St.-Etienne 0.9; for Nantes 1.2; for Havre 0.8; for Rouen 2.9. It is interesting to note that, leaving Paris out of the

count, the excess of births over deaths has occurred only in those cities where there has been comparatively little immigration from the provinces, as at Havre and Saint-Etienne. From this we may draw the conclusion, apparently paradoxical, that immigration exercises an unfavorable influence on the birth rate of a community. At first sight this would appear an inadmissable anomaly, but it is explained by the fact that a majority of the young men and women drawn to the cities by the prospect of better salaries, a more varied existence, and lighter work, are doomed to dire disappointment. They seldom marry, and, whether they marry or not, their offspring usually pays the price of their extreme poverty or shame. No one can tell how many young lives are cut off before they have realized what it is to live. To them the world opens but to close again in darkness and the tomb; it is but one step from the cradle to the grave, and the most robust and healthy succumb equally with the feeble or non-viable. Something must be done to stem this terrible tide of destruction, which overwhelms so many of their "innocents," and already communities are compounding with immorality by offering a bonus on the life of every child born out of wedlock.

But it is unnecessary to dwell upon the deaths; it is only necessary, for the purposes of this paper, to consider the alarming reduction in the natality, and the causes leading to it, of which the emigration of young men and women from the provinces to the centres of population seems to be one of the principal. And why? Because misery and hunger are a bad foundation for a family. One has not the leisure to dream of the charms of married life where one cannot find the opportunity to earn one's daily bread by honest labor. The visions of wealth and happiness which fill the peasant's imagination, when he gives up a comfortable home in the provinces to encounter the uncertainties of life in the city, too often end in the *cauchemar* of a prison or a hospital. In 1891 the arrests in Paris for crimes and venial offences comprised 41,713 persons, of which 25,004 were from the provinces; the municipal refuges gave asylum to 96,776 individuals, of which 74,138 were also from the provinces, and out of the large number of persons relieved annually by public assistance it has been found that at least 56 per cent are natives of the provinces, who have sought to better their condition by taking up residence in the city.

I have not been able to secure satisfactory statistics on the movement of population in the different cities, but it is convenient to note here, that at Bordeaux in 1893, of the numerous persons cared for in the "Night Asylums," 94.6 per cent were strangers, for the most

part from the provinces. But we are not yet at the end of these calamitous statements. From 1880 to 1891, according to census reports, 655,152 young people emigrated from the provinces to the cities, and it is safe to say that many became invalids, mendicants and criminals, whereas if they had remained in the country they would no doubt have married and raised families, thus adding to the birth rate of the State.

Among the rural population of France, where in 1887 the birth rate amounted to 24.1 per thousand, it had fallen in 1890 to 20.7—a decrease of 8.6 per cent, representing in figures an absolute annual loss of 91,000 births, due in a great measure to emigration. But as no barrier can be opposed to this movement, so disastrous to the prosperity of the country, the only practical thing to be done is to compensate, as far as possible, for the loss, by increased care, not only of the children born, but also of the mothers who bear them. This may be done by proper hygienic measures, whether in the nature of improved sanitation, or by the application of a wise and timely provision for the comfort of the mothers, before and after the birth of their children. The number of children born dead, and the number dying in the first year of life, in all countries, is very great; but in France the evil is simply appalling. This might assuredly be diminished by the influence of competent circumstances on the one hand, and the cultivation of moral habits on the other. The former would invite more attention to the wants of both mothers and children among the great mass of the people, while the latter would insure the prevalence of more maternal care.

It has been found that among the *proletaire*, or poorer classes, of France, women bring forth their offspring under the most unfavorable circumstances that can be imagined. This is principally on account of their having to work up to the last moment of pregnancy, and from the absence of proper and sufficient nourishment immediately before and after their accouchement. To lessen this evil, and at the same time to diminish the dangers of the child, it is now proposed to establish in all the centres of population throughout France "Maternities," where women can receive the best attention, both before and after confinement. Some generous spirits have already organized such charities in Paris, Bordeaux, Lyon, Havre and Roubaix.

In Paris, Madame Bequet has recently built a refuge of the kind in the Avenue Maine, and the municipality has constructed another in the rue de Talbiac, known as the Asylum Michelet. Both estab-

lishments receive *les femmes enceintes* in the last days of pregnancy. Here they are properly nourished and cared for, and only leave the Refuge when they are able to enter again upon service. The happy effect of rest and quiet, and proper nourishment, has been shown by Dr. Pinard in a statistical comparison between children born of women who have worked to the extreme limit of pregnancy, and those born of women who have been kept in repose during a period more or less long, whether in a public refuge or in a private asylum.

500 women, having worked up to the moment of their confinement, gave birth to children weighing in the aggregate 3,010 lbs., on an average of 6.02 lbs.

500 women who sojourned in an asylum at least ten days gave birth to children weighing 3,290 lbs., or an average of 6.58 lbs.

500 who were received and treated at the Clinique Bandelocque more than ten days before confinement, gave birth to children weighing 3,966 lbs., or an average of 7.93 lbs.

In a general way these figures show the happy influence which the repose of the mother has upon the offspring. Other statistics equally attest the fact that mothers without a reasonable period of rest before confinement bring into the world weak and sickly children, who fall an easy prey to those maladies which lie in ambush wherever bad sanitary conditions prevail, as for example in badly drained and ventilated tenement houses, and other hovels of misery.

Statistics regarding the population of France during 1894 have just been published in the *Journal Officiel*. There have been 286,662 marriages; 6,419 divorces; 855,388 births and 815,666 deaths. Compared with the statistics for 1893, those for 1894 show a decrease of 632 in the marriages, 19,284 in the births and 51,906 in the deaths. The divorces, on the other hand, show an increase of 235. The characteristic features of the year are a decrease of 6 per cent. in the deaths. It seems, therefore, as if the population of France is only kept up by a decrease in the number of deaths.

According to the English census of 1891, the United Kingdom (Great Britain and Ireland) contained 37,797,000 inhabitants, and according to the French census of the same year, France had 38,343,000, a difference of about half a million in favor of France. But the excess of natality over mortality in France from 1890 to 1894 was only about 75,000, while in the United Kingdom for the same period the births exceeded the deaths by 1,208,000. We have seen that in 1891 the population of France exceeded that of

Great Britain and Ireland by 546,000; but in 1894, for the first time in the history of the two countries, the population of the latter surpassed that of the former by about 500,000. This is the more surprising when we reflect that the territory of the United Kingdom is less than three fifths that of France, which contains a superficial area of 205,000 square miles, while that of the United Kingdom has only 121,115 square miles, less than two acres of land for each inhabitant.

The following tables kindly furnished me by the Registrars General of England, will show the relative percentage of births and deaths in the several States cited.

INTERNATIONAL VITAL STATISTICS.

Births and Deaths per 1000 of the Population, in the UNITED KINGDOM and in OTHER EUROPEAN STATES.

(Tabulated from returns furnished by the authorities of the various States.)

YEAR.	United Kingdom.	England & Wales.	Scotland.	Ireland.	Denmark.	Norway.	Sweden.	Austria.	Hungary.	Servia.	German Empire.	Prussia.	The Netherlands.	Belgium.	France.	Italy.
BIRTHS TO 1000 LIVING.																
Average in the 10 years 1881-90	32·6	34·0	32·6	34·9	31·7	30·7	32·6	38·6	44·0 (1891.)	39·4	36·1 (1891.)	38·2	35·2	31·0	24·0	37·0
1881																
1882																
1883																
1884																
1885																
1886																
1887																
1888																
1889																
1890																
DEATHS TO 1000 LIVING.																
Average in the 10 years 1881-90	19·9	20·1	20·4	16·0	19·0	16·9	17·6	30·6	29·7 (1891.)	29·1	23·0 (1891.)	21·6	23·6	21·4	22·3	29·6
1881																
1882																
1883																
1884																
1885																
1886																
1887																
1888																
1889																
1890																

In comparing the Statistics of Paris with those of Berlin, we find that the French capital, in 1890, contained 45.80 per cent. more inhabitants than the German capital; but the aggregate increase of population in the latter exceeded that of the former by 24.63 per cent. The municipality of Berlin has just made public

the results of the quinquennial census for the period ended December 31st, 1895, from which it appears that this city contains 1,647,115 inhabitants, of which 797,186 are males and 876,929 are females. The quinquennial census of Paris for the same period has not yet been published, but the following table will show the relative percentage of increase in the two cities during the two preceding quinquennial periods:

Cities.	Increase of population 1880 to 1885.	Increase of population 1885 to 1890.
Paris.....	3.22 per cent.	4.85 per cent.
Berlin....	17.10 " "	20.08 " "

It should be noted that the progressive increase of population in the city of Berlin during the periods above mentioned was not maintained for the last quinquennial period, from 1890 to 1896, when it fell to 6. 30 per cent., a decrease of 12.64 per cent. below the average of the preceding ten years. This falling off, however, is more apparent than real, since it has not been occasioned by an excess of mortality over natality. It may be attributed, (1) to certain social questions; (2) to the successful efforts which have been made by the State, in the way of extensive advertisements, to prevent the poor from the rural districts crowding into the city, hoping to better their condition; (3) and, above all, to the immense development of the suburbs of Berlin, where the population has increased in the last decennial period from 50 to 60, and even 80 per cent., thus depleting the number of inhabitants dwelling in the city, but without injury to the material prosperity of the city, or to the body politic.

HAVRE, April 23rd, 1896.

P. S.—Since writing the foregoing, attention has once more been drawn by the decennial census of 1895, just completed, to the gradual diminution of the population of France. Long ago lamentations over what was described as a "national peril" were uttered; but the prospect has not improved, and the position which France will hold among the nations at a given date can be calculated with tolerable accuracy. At the outbreak of the revolution in 1879, France headed the European list with twenty-six millions; yet this country, which formerly had 28 per cent. of the entire population, has now come down to 13 per cent. The steady diminution has never been arrested since the beginning of this century. Up to 1810, the yearly average was 33 births to 29 deaths

among every thousand inhabitants. The census returns for the decennial periods from 1801 to 1891 give the following figures: From 1801 to 1810 the birth rate was, as above stated, 33 per 1000, then 32, 31, 29, 27, 26, 25, 24,—to-day it is only $22^{6}/_{10}$ per 1000. These figures are more striking when compared with the statistics of other countries. Only Ireland, with a birth rate of 23 per 1000, approaches France. In Belgium for every 1000 of population there are 28 births; Holland 33; Spain and Germany 36 to 37; Austria 37; Hungary 42; Russia 49.

April 23rd, 1896.

THE PURIFICATION OF PUBLIC WATER SUPPLIES.

The Address on State Medicine, delivered at the Forty-Seventh Annual Meeting of the American Medical Association at Atlanta, Ga., May 5-8, 1896.

By GEORGE H. ROHE, M.D., Baltimore, Md.

THE most vitally important sanitary problem confronting American municipalities at the present day is, unquestionably, the supply of pure water for drinking and other domestic purposes. The wide-spread prevalence of typhoid fever may be practically looked upon as a measure of the pollution of the drinking water. Depending as this disease is almost entirely upon an infected water supply, the importance of having the latter of a pure quality is self-evident. In 1894, twenty-five of the principal cities of the United States had an average typhoid mortality of 39.6 per hundred thousand of population. Those cities which had the largest mortality from this disease were supplied by a highly suspicious quality of drinking water.

It will be hardly necessary at the present day to insist upon the etiologic relation of infected water to typhoid fever. The numerous epidemics in this country and abroad, which have been studied with so much care by eminent sanitarians, have demonstrated this relation. While cases doubtless occur in which the disease cannot be traced to the water supply, these constitute the vanishing minority, the overwhelming majority being unquestionably due to infected water.

In epidemics of cholera a similar relation exists between the outbreaks and extension of the disease to an infected water supply. Aside, however, from the production of these specific diseases,

pure water, or water free from all sorts of uncleanliness, is demanded by the "sanitary conscience" of the public.

These premises being conceded, the great importance of securing a supply of drinking water free from contamination, becomes apparent.

In sparsely settled districts, or where a supply of unpolluted water can be brought from a distance to a large community, it will probably be better to secure such a pure supply rather than purify a source of supply which has been polluted; but in the majority of instances, particularly in the eastern and central sections of this country, the procurement of such an unpolluted supply is practically barred by financial considerations. We are therefore reduced to one of two alternatives—either to limit as much as possible, or altogether prevent, which is practically impossible, the access of impurities (notably of sewage or excremental matter) to the sources of supply; or else to resort to some method of purification of the water after it has become polluted.

The city of New York has recently chosen the first alternative mentioned, by the purchase of ground immediately bordering upon the steam furnishing the drinking water to that metropolis. By the removal of sources of pollution from the area of land so acquired, the endeavor has been made to secure a pure drinking water.

I have not at hand the figures, showing the amount of money expended in order to accomplish this purpose, but the sum must have been very large. In Chicago, the extraordinary outbreak of typhoid fever from 1889 to 1893 led to the extension of the intake pipes in Lake Michigan to a distance of four miles from the shore, and the consequent diminution of the sewage contamination has reduced the typhoid mortality from 159.7 per hundred thousand in 1891 to 31.4 per hundred thousand in 1894.

In most instances, however, where large communities are supplied with polluted water, the changing of the source of supply is impracticable. A recent inquiry by a commission of engineers upon providing a new supply of water for the city of Cincinnati, has taken into consideration a scheme for drawing the supply from the Cumberland Mountains, a distance of 130 miles away. The estimated cost of this work was $27,000,000. Another scheme considered by the same commission, was to draw the supply from Lake Erie, 250 miles distant, at an estimated cost of over $40,000,000. Chicago expended $3,500,000 for the construction of the tunnel into the lake at its very doors.

These figures will probably be sufficient to show the impracticability, from a financial standpoint, of abandoning a source of water supply that may be polluted, now in use by any community, and going a great distance in search of a pure water supply. Fortunately there is at our hand, however, a means by which a source of supply once polluted can be again rendered pure; this is *filtration.*

Formerly, filtration simply meant straining out from water all gross impurities, and changing a dirty or muddy water into a clear and limpid fluid. It did not contemplate the changing of organic compounds into inorganic compounds, or the removal from the water of minute organisms, which we have learned to regard as causes of specific diseases. Our notions of what constitutes purification of water have considerably changed. We now know that water may be perfectly clear and limpid, and yet be extremely impure by reason of its content of impure organic matter or dangerous microörganisms. The results obtained by the filtration of sewage, in which a highly impure liquid, full of organic matter and teeming with microörganisms of various kinds, is rendered clear, limpid, almost entirely free from organisms and organic matter, have taught us how to purify a polluted water, which in many instances is simply a highly diluted sewage.

This method of speaking of polluted water supply is not an exaggeration, when we study the published reports of the analyses of the water formerly used by the city of Lawrence, in Massachusetts, and now used by Jersey City and other larger and smaller communities in this country.

A great impetus to filtration was given by the experiments conducted under the auspices of the Massachusetts State Board of Health at Lawrence in that State, and carried out so thoroughly by Mr. Hiram F. Mills and Mr. Allen Hazen. These experiments, carried on with painstaking care for a number of years, prove conclusively that water, no matter how polluted, can be rendered pure by simply filtering the same through sand filters, provided certain cautions were observed regarding the construction of the filters, the rate of filtration, and other conditions varying with the character of the water to be purified.

For many years, filtration through sand has been used by European municipalities to secure purification of water. In London most of the drinking water has been filtered for upward of forty years. The filter beds of Berlin cover an area of more than thirty

acres. In many of the European continental cities the drinking water is subjected to filtration. The construction and practical management of filters have been investigated with great care. Comparative studies of the efficiency of sand filters, and of various processes of so-called "mechanical filtration," have been made recently in Providence, R. I., and at Lawrence, Mass. While the results obtained by different investigators have not been in entire agreement, the prevailing opinion of sanitarians and engineers is that sand filtration, where it can be adopted, gives the best results in purification, at the lowest cost of construction and maintenance.

Koch has given the following clear explanation of the process of sand filtration:

"The problem of filtration is to purify water from the matter held in suspension. Matter which has been dissolved goes through the filter with hardly any or with no perceptible change. As the chemic investigation of water has chiefly to deal with inquiry into the constituents which have been dissolved, it cannot aid in studying the processes of filtration. But in earlier days one was so much accustomed to judge the character of water according to its chemic characteristics that, in complete ignorance of what took place in the process of filtration, one attempted to test and regulate the process chemically. Naturally, no useful result ever came of this. The specialists in filtration had found this out even in early times, and had attempted to obtain aid in some other way. They tested the water in glass or metal cylinders, the so-called 'water-tests,' as to its transparency before and after filtration, and according to the result they judged of the value of the sand filters. By this simple means they succeeded in discovering the most important conditions for a sufficient purification of water from its suspended constituents. From this it appeared that the real filtration does not take place in the sand, but that, by deposit from the still unpurified water, a layer of mud is formed on the top of the sand, and that this layer of mud which is over the sand, is the real filter which retains the suspended constituents from the water. In the process of filtration the important point is first that a proper layer of slime should be formed, and that it should not be disturbed during the process of filtration, and that when by further continuous deposit it becomes too thick and therefore too impermeable to water, it should be removed. According to all appearance different natural waters are capable of producing the filtering mud layer in very different degrees, according to the amount of mineral and vegetable matter held in suspension. Some river

waters which are especially rich in clayey constituents can deposit a good filtering mud layer in eight or ten hours. Other kinds of water rendered more turbid by vegetable matter require a longer time, at least twenty-four hours, to form the deposit. At certain periods of the year, especially at the time of the so-called 'water-bloom,' owing to the appearance of innumerable microscopic algae, the vegetable constituents suspended in the water are increased to an extraordinary extent and are of a particularly slimy character, and form therefore a layer which in a few days becomes nearly impermeable to water and must be removed. From these brief remarks it will appear that in sand filtration we are not dealing with so simple a matter as is often supposed. It has also been discovered that in the gradual wearing out of the sand layer it should never be allowed to get below a certain thickness, about 30 cm., and that a certain speed, about 100 mm. in the hour, must be allowed for the movement of the water through the sand layer to obtain the most perfect purification."

Koch further states that a daily or tri-weekly bacteriologic examination of the filtered water must be made in order to test the performance of the filter. "If a filter works satisfactorily in every respect, experience shows that there will be found less than one hundred germs capable of development in one cubic centimeter of water; and this is irrespective of the number of bacteria contained in the water before filtration." The slightest changes in the rapidity of filtration, or the disturbance of the filter bed, become manifest on bacteriologic examination.

The cholera epidemic in Hamburg in 1892 furnished an object lesson of great value. Hamburg and Altona both draw their water supply from the river Elbe. In Hamburg, in 1892, the water was furnished directly to consumers without filtration; in Altona, on the other hand, the water had been for a number of years filtered. The Hamburg supply was drawn from the river at a point where there was comparatively little pollution, but the Altona supply was drawn from the Elbe immediately after the stream had received the sewage of the entire population of Hamburg, numbering nearly 800,000. As a matter of fact, cholera bacteria were discovered in the Elbe water below the main outlet of the Hamburg sewers. There was every reason to expect, therefore, that the cholera would have been more virulent in Altona than in Hamburg; but the contrary was the case.

In Hamburg about 21,000 persons were attacked by cholera, of whom over 11,000 died during the epidemic. In Altona, on the other hand, there were not over 500 cases—400 of which were shown to have been importations from Hamburg, thus leaving the small number of 100 cases traceable to infection in Altona. Koch, who made a very careful inquiry into the circumstances of the outbreak at Hamburg, came to the conclusion that the comparative immunity of Altona was due to the filtration of its water supply.

Returning to the consideration of typhoid fever, we have in the United States an example of the limitations of this disease, produced by the purification of the drinking water by means of filtration. For a number of years, the city of Lawrence in Massachusetts had suffered from typhoid fever to an unusual degree. For the six years from 1887 to 1892, the typhoid deaths in that city averaged 50 annually, a proportion of 119 per 100,000 of population. In 1893, the drinking water, drawn from the Merrimac river, was subjected to filtration, and at once the typhoid death rate began to fall. In 1895, two years after the filtered water had been in general use in the city, the number of deaths had fallen to sixteen, of which nine occurred among "operatives working in certain mills where unfiltered water was used for washing purposes, and was used for drinking by the operatives, notwithstanding the prohibition of such use, because the river water was more accessible than the city water." (Quoted from a paper by Mr. Allen Hazen in the *Health Magazine* for March, 1896.) In two cases, the disease was believed to have been imported, and in five, the origin was not accounted for.

The conditions, under which filtration takes place, have been studied particularly in the experiments made at Lawrence, above referred to. Without going further into the details of the construction of filters, two processes must be kept in view—one, the removal or straining out of the bacteria, always present in water; and the other, the oxidation of organic matter, and its conversion into inorganic compounds. These imply, that the materials, of which the filter is constructed, shall be sufficiently fine to hold back all suspended matters, and that a sufficient supply of oxigen shall always be present in order to allow the oxidizing process to go on. In most natural waters there is a sufficiently large quantity of free oxygen to allow the oxidizing processes to go on continually, but in cases where the water is highly polluted, it is

necessary to permit access of extra quantities of oxygen, in order that all the organic matter may be oxidized. This may be accomplished, either by aeration of the water before filtration, or by carrying on the filtration intermittently, allowing the air to penetrate the interspaces in the filter before the water is again turned on the filter. This is in effect what is done in the intermittent filtration or the broad irrigation of sewage.

In the experiments at Lawrence, it was found that an average of 98.54 per cent. of the bacteria found in the river water were removed by filtration; under favorable conditions, *i. e.*, with filters of the best construction, and a moderate rate of flow— less than 1 per cent. of bacteria remained in the water after it had passed through the filter.

Within the last two years an extended series of experiments upon filtration with so-called "mechanical filters" were made in Providence, R. I., with the view of adopting a system of filtration combining efficiency with economy. The apparatus most thoroughly tested is known as the "Morrison filter," and its construction is described as follows:

"The filter bed of crushed quartz was two feet, ten inches in depth, supported upon a base of iron with circular perforations of about four inches in size, which were covered with screens. The crushed quartz used was the effective size of 0.59 millimeters. The filter was washed by a reversed current, which caused the quartz to boil. The agitation and friction of the particles were increased by means of a rake with long teeth, which revolved about a central column in the filter; the rake penetrating the bed by a screw motion from top to bottom." One-half grain of basic sulphate of alumina was used to the gallon of water filtered, in order to produce a film upon the surface of the filter. This constitutes the real filtering layer, corresponding to the mud layer in the natural or sand filter.

The results obtained in these experiments showed that with careful management, from 92 to 99 per cent. of the bacteria contained in the water could be removed by mechanical filters. Further investigation demonstrated, however, that the installation and management of these filters would be more expensive than sand filtration, with no increase in efficiency.

On the whole, it is probable that sand filtration, having been thoroughly tested both by experiment and practical experience, must be regarded as the most efficient method of purifying a pol-

luted water supply; and that, when carefully and intelligently managed, it can be depended upon for purification has been shown in the experience of Altona and Lawrence.—*The Journal*, May 23, 1896.

SANITARY PROGRESS IN SAVANNAH, GA.

By J. C. Le Hardy, M. D.

Dr. A. N. Bell, Editor Sanitarian :

I comply with pleasure to your request for a description of, and statistics showing the progress of sanitation in the city of Savannah—from the time of her origin to the present day.

The good effect of sanitary measures upon the healthfulness of the city and upon the appearance and the energy of her inhabitants are so striking that the narrative will, I hope, prove interesting to the readers of your valuable journal.

Savannah was settled in 1732 by colonists brought over from Europe by General Oglethorpe, who had purchased the site from Tomochichi, chief of the Yamacran Indians. Placed upon a high bluff, forty-five feet above low water mark, it was selected by him on account of its position and other natural advantages. It lies on the south side of the river for which she was named.

The bluff, fully one mile in width, and extending many miles in a southern direction, was covered with a pine forest flanked on both sides by dismal swamps completely hidden by a dense growth of trees and vines. A clearing for the settlement was made near the river, east of the village occupied by the Yamacran. The location proved to be a very healthful one, and it remained so as long as the swamps remained undisturbed. Dr. Wimberley Jones says that "Savannah was visited every summer by inhabitants of Charleston on account of her salubrity." But as soon as the luxuriant growth covering these swamps was removed for the purpose of cultivating rice and indigo, "fevers, bloody fluxes and other dangerous complaints soon prevailed" (C. C. Jones), and in the latter part of the last century she already was a very sickly place. In the early years of the present century the records show that the death rate amounted to 1 in every 11 of the population. Dr. W. C. Daniell states that in 1815, the death rate was 1 in every 15; in 1816, 1 in every 18; in 1817, 1 in every $9^{2}/_{3}$. In 1820, Savannah was visited by one of the most fatal yellow fever epidemics that

ever occurred in the United States. Dr. Wm. Waring tells us that the average mortality that year was one in every five of the inhabitants. One of the first acts of the Georgia Medical Society, founded in 1804, was to urge upon the authorities the necessity of replacing the culture of rice wet culture, by dry culture, to improve the sanitary condition of the town. After a very long struggle the city council finally passed an ordinance requiring the substitution of dry for the wet culture, and its enforcement was soon followed by a decrease in the virulence of the prevailing fevers and a reduction in the rate of mortality. Dr. W. C. Daniell, in his pamphlet "Upon the Autumnal Fevers in Savannah" (1826), gives a table showing the rate of mortality to population: in 1821, 1 in 37; 1822, 1 in $33^{4}/_{5}$; 1823, 1 in $32^{1}/_{6}$. He says that "Previous to the introduction of dry culture system, the bay was as notoriously the most unhealthy part of the city, as that portion lying south of South Broad Street was the most healthy. The reverse now obtains for reasons equally obvious. The bay, from its proximity to the lands, subjected to the dry culture system, is more immediately under the influence of that system, and its improved salubrity is one among the many unequivocal evidences of the agency of the latter upon the health of Savannah. Whereas that portion of the city south of South Broad Street, formerly furthest removed from the cultivation of rice, has within the last three years been thrown more immediately under the influence of the wet culture by the opening of an extensive rice field to the southwest."—The increase in the area of rice lands on her flanks, the numerous depressions and ponds within the city limits that filled with stagnant water after every rain storm, the inadequate drainage of the adjoining slopes and lowlands, all combined to render Savannah a very sickly place during the summer months. From early May until December malarial fevers from the mild intermittent to the most malignant remittent were endemic, and cases of sporadic yellow fever also occurred occasionally.

In the summers of 1820, 1854, and of 1876, yellow fever was epidemic. Dr. R. D. Arnold, a physician of wide reputation, gives such interesting details on this subject in a pamphlet "On Bilious and Yellow Fever" (1856), that I quote the following extracts: "I have witnessed every epidemic in the city of Savannah from the year 1830 to the present time. For fifteen consecutive summers I was the attending physician of the city hospital, whither the worst cases of our ordinary climate fever are conveyed, while year after

year I met with malignant and fatal cases of bilious fever, only very few cases of yellow fever occurred. From 1830 to 1839 I never saw a case of yellow fever in the city. In the last of August, that year, a patient fresh from Augusta (where yellow fever was epidemic) entered the hospital and died in a couple of days. The post mortem proved the disease to be genuine yellow fever. A short time afterward a patient from Charleston entered and died, also from yellow fever. Although these cases were placed in the wards of a hospital filled with bilious fever patients, there was no propagation of the disease. I met one solitary case of yellow fever with black vomit in the fall of 1840. It was in an unacclimated foreign lady who had not stirred out of the city during the whole summer.... In March, 1841, a case was brought to the hospital from Demerara and in October of the same year a case occurred in my private practice. From this date until 1852 when I saw a sporadic case, I met with no yellow fever until the fall of 1852. Late in September an unacclimated painter was attacked with it, in the north-eastern portion of the city, where he was working. He was removed to the hospital after he had thrown up black vomit, and he died. In 1854 it was my lot again to have the first yellow fever patient. I was called out on the night of the 3d of August, and he died on the morning of the 5th after having disgorged quarts of genuine black vomit... My last case died on the 27th of November. During the intermediate time I had seen hundreds of cases of genuine yellow fever."

Dreading the return of the yellow fever, the city authorities enforced the dry culture system in 1821, and a marked diminution in the mortality was brought about by this measure. But as soon as the city limits extended beyond the dry-culture lands, both sickness and mortality again increased. To overcome this evil men were employed to fill depressions, trenches were cut with the plow after rain storms to let the water run from shallow places and shortlines of brick sewers were built to empty some of the deeper ponds, but no permanent benefit was obtained for the want of system in carrying on these sanitary works. (Besides malaria there were other causes of sickness in Savannah, which seem to have been overlooked by the authorities. The foul emanations arising from privy vaults, from stables and cowpens, and from the offal; kitchen refuse, house slops, wash water, etc., thrown into yards, streets and lanes! The privies at the rear of every habitation were crude wooden structures placed over uncemented brick vaults,

allowing gases to escape, and the fluids to percolate through the soil. The stables and lots where animals were kept were covered with manure, and as the Buzzard was the only *authorized* scavenger, filth accumulated everywhere. The effluvia arising from a soil in such a condition, during the long heated term of this semi-tropical climate must be injurious to health, and it is evident that the well-water used for drinking purposes, only fifteen feet below the surface must be polluted was an important factor in the causation of disease.)

No important sanitary work was undertaken here until 1853, when water works were established and the citizens supplied with river water (one of the purest in the country) in great abundance; but a prejudice against drinking river water existed in the mind of the people, and for years afterwards it was not in general use.

The year 1854 was characterized by a yellow fever epidemic of great severity, the last one, perhaps, where the fever was purely monoparoxismal, black vomit frequent and almost always a fatal symptom, and, as is usual after such a calamity, there was a spirit in sanitary work. Some attention was paid to the removal of garbage, drains were dug and short lines of sewers built, but this good work ended with the administration that started it, and had no lasting effect upon the healthfulness of the city. Consequently we had an epidemic of dengue (broken bone fever) during the summer of 1858, which was followed in September by a localized epidemic of yellow fever in the north-western corner of the city.

In 1864, while blockaded by the enemy's squadrons, the low lands west of the city being submerged, to protect us from land attacks, late in October, a considerable number of cases of genuine yellow fever occurred upon the western slope, where malaria fevers of a malignant type had raged during the summer.

During her occupation by Sherman's army, 1865, small pox made fearful ravages among the negroes, who flocked into the city under the protection of the Stars and Stripes. These negroes, unprotected by vaccination, without food or shelter, fell a ready prey to the scourge. Hundreds died (many in the streets) of whom no records were kept. So great was the number that the dead bodies were picked up where found, put in garbage wagons and dumped into trenches dug for the purpose.

The policing of the city under army regulations was done thoroughly, and its good effects upon health became manifest as soon as the small pox subsided, and the lesson, although taught by our enemies, has been of great value to us! The city officials

having given closer attention to the removal of garbage and the cleaning of streets ever since.

Through the energetic efforts of Dr. J. J. Waring, the most important sanitary work ever done for Savannah, was inaugurated in 1868. A system of large, deeply laid brick sewers was commenced. The first about a mile in length, was built across the southern portion of the city and soon dried all the ponds and bogs of that section, and rapidly carrying off the rain water. The good effects of this drainage upon the health of the inhabitants was so manifest that those in authority considered it advantageous to continue the work and another much larger and longer sewer was built in the business and most populous portion of the city. Crossing it from west to east, thence running south, until it joined the first sewer, thence east to the Bilbo canal, an open drain, running northward and emptying into the Savannah river.

These sewers built of porous brick with the lower segment uncemented for the purpose of carrying off storm water and draining the subsoil, did the work admirably, and to render them more effective smaller drains which empty into them were laid in almost all the streets. The result of this great work was to lower the water bed by at least ten feet and to carry off all of the storm water with great rapidity. It had a most remarkable influence in ridding our city of malarial fevers, neuralgies, rheumatism and pleurisy; and in reducing the mortality to a low percentage. Had our city fathers continued to extend subsoil drainage where it was needed and given us a separate system for the removal of sewage, we would have been spared the yellow fever epidemic of 1876, and Savannah would rank with the most healthful cities in the country. But in order to save a few score thousands of dollars, they permitted water closets, kitchen sinks, etc., to be emptied into the network of storm-water drains which underlies our city, that converted the drains into sewers, reeking with putrefying filth and the germs of disease. In consequence of this, typhoid fever and the continued fevers, formerly unknown to us, soon appeared and have remained with us since, while scarlet fever, diphtheria, measles, mumps and other filth diseases, so seldom seen before, are now constantly among us.

The following extract from a report made in 1876-77 by Dr. Jas. J. Waring, himself an alderman and the chairman of the Health Committee of Council fully illustrates how little regard the average alderman has for matters pertaining to health: "1. All the low lands around the city were intensely malarial and imperfectly drained or not drained at all. 2. The western and eastern

slopes nearer still to the city were sobbed and dripping. 3. The western slopes and Springfield low lands were the place of deposit of the entire garbage and refuse of the city for the past twelve years. 4. Two hundred acres of the western low lands, including the garbage dumps within the corporate limits, had been just before the epidemic the scene of one vast overflow, resulting in the conversion of this last area into an extensive rotting surface of the most offensive character. 5. The dry culture contract lands on Hutchison's island had been neglected for fifty years. 6. Property-owners had failed to dry their own lands around the city. 7. The Bilbo canal was fouled and silted up. 8. There were immediately east of the city 13 acres of land within the area of dry culture that were covered with stagnant water. 9. The south-eastern swamps in close proximity to the city had never been drained, and were intensely malarial. 10. Ponds east and west, formed by excavations of brickyards were offensive masses of stagnant water, always covered with a green film. 11. The privies of Savannah, 3,666 in number, are a sore evil, always offensive and foul."

Immediately after the disappearance of yellow fever the State Board of Health of Georgia (then in existence) met at Savannah, to investigate the condition of the city and to ascertain the causes of the epidemic. While the members of this board and their coadjutors did not agree as to its origin (some holding that the germ must always be imported, others that yellow fever is of local origin), they all united in condemning the condition of the privy vaults, the dry wells (covered and unventilated cesspools receiving the discharges from water closets and kitchen sinks), the storm water drains fouled by deposits of fecal matter, etc., of the garbage dumps covering acres in dangerous proximity to habitations; but that they considered the condition of the lowlands within and around the city the greatest source of danger to public health is evidenced by the fact that they urged upon the city authorities their immediate drainage. The board secured from the Legislature an appropriation for the purpose of at once undertaking the work. The appropriation was, however, too small to accomplish much, but it proved an incentive to further action. Our county commissioners, who were all public-spirited men, undertook the important work of draining the county and bent all their energies in its prosecution. Surveys were made by competent engineers and drains cut in all directions around the city. Finding hired labor too expensive they employed convict labor to do the work, and

very soon the swamps, the bogs and morasses in our environs were transformed into productive truck gardens and luxuriant cornfields. The improvement in the health of our people was wonderful: Chills and fever and its attendant, enlarged spleen, disappeared and the sallowness and sluggishness due to malarial poisoning and to inertia of the liver was replaced by ruddiness and activity. Never before was seen such a rush in our business circles, such a stirr in our commerce! Savannah almost bankrupted from losses incurred by the war and by the recent yellow fever epidemic, soon restores her credit. Nay, more—in a few years she attains rank among the great markets of the world, holds the first place in naval stores and lumber and the third in cotton exports!

As long as the drains were kept running and regularly cleaned it was a rare thing to meet a case of malarial fever from one year's end to the other. But this great blessing did not last long. The administration of the county's affairs changed hands, and newcomers, actuated by selfish motives, instead of completing the system of drainage so happily begun, turned their attention to improving private property. For this purpose roads were made, lands levelled, drains and canals dug, and the work of the convict was also used to subserve political purposes. The drains around the city being neglected the low lands became so sobby that they had to be abandoned, and the inhabitants, after years of exemption, were again subjected to malarial fevers, rheumatism, neuralgias, etc., the malarial influence being felt even in the heart of the city.

J. C. LEHARDY.

Savannah, Ga., June 22, 1896.

A USE FOR PATENT MEDICINE LITERATURE.—It is a favorite axiom of the optimists that everything has its uses. But it has remained for the New Mexico Territorial Board of Health to find a use for the patent medicine almanac. In a recently issued circular on the prevention of consumption, among other things, it is advised that "every person so affected should spit into some receptacle and should see that the sputum is soon destroyed by fire. About the house there is no better way than to spit between the leaves of patent medicine almanacs—to be had freely at all drug stores—and after a half dozen or more spittings burn the book."

WHAT SANITATION HAS DONE FOR LIFE.

FOR conciseness and force in dealing with the results of Sanitation, the address of Prof. Brewer of Yale University, recently delivered before the Life Association of Western Massachusetts, has rarely been excelled. The question has often been debated, but never satisfactorily answered, whether there was any substantial gain to human life from the ordinary medical methods of combatting specific cases of disease, or whether the mere elimination of one form of disorder did not have its compensation in the development of some other. In respect to sanitation, however, there can be no dispute. The gain is unquestioned and immense. The span of life measured from infancy to old age may not have been lengthened, but the number of those dropping by the wayside has been so effectually reduced that life-insurance rates today are not what they must have been a hundred years ago. We cull the following striking passages from the address of Professor Brewer:—

That human life has been prolonged by the application of science in the last fifty years, no one doubts. How this has come about forms an intensely interesting chapter in the history of our civilization. But it is not a simple story. How much, mathematically, this amounts to, in years, in percents, is an unanswerable question. We can never have the data in figures. Even if we had our vital statistics completed for that period, men would differ as to the relative value of the several factors in this problem. Our great cities would not exist—they could not exist without the aids of science. As to what would take place, the answer is as uncertain as the answer to the question, "What would now be the condition of Europe if Napoleon had never been conquered?" "If Columbus had not discovered America, who would have discovered it?" What we can say is that science has wrought so many changes that our civilization of to-day is very much in advance of what it would have been without science, and the prolongation of human life is but one phase of the relations of science to modern civilization. We have had an ancient Egyptian and Greek and Roman civilizations, which were pagan, and later Christian civilization, and all were powerless to convert practices. Between the epidemics that raged from time to time and the high

death rate in the best of years, the population of Europe, as a whole, probably scahcely increased at all for 1,000 or 1,200 years.

This century came in without a single city in Christendom with a million of inhabitants. Paris had in 1800 but 548,000; London and its suburbs in 1801, 864,845. The other great English cities had less than 100,000. Great cities could not endure then. First, the people could not be fed. Then, most of the population had to be fed and food produced within 20 miles of the place of consumption. Science has now made it possible to transport food half-way around the globe, and has discovered new methods of preservation as well. City population was not self-perpetuating. Man died off; the death rate was continually high, and from time to time there was death by pestilence. Even where there were sewers, they were to drain the ground of water, rather than to carry away sewage. Now cities are made nearly as healthy as the country. Another reason why there could be no great cities in the modern sense related to business matters purely. I have dwelt upon this phase because cities are containing a larger and larger proportion of the inhabitants of civilized countries. And human life in cities is much prolonged. It is a law long ago demonstrated that the death rate increases as the density of population increases. This is still true, but sanitary science has enormously diminished this rate.

Sanitary science has been of slow growth but of rapid fruitage. It was 200 years ago that a Dutch scientist discovered the yeast cell, but the actual significance and working of the cell was not understood until 150 years later. In 1837 it was discovered that in the yeast cells were living organisms which were multiplying in the fluid in which they grew. This was the cause of fermentation. For years chemists quarreled as to whether these germs were the cause or the effect of this fermentation, but the former theory is now fully established. Then another dispute arose as to whether life could originate in decaying animal and vegetable matter, but it was finally proved that this did actually occur.

This theory forms the foundation of the modern disinfecting processes, and from this time diseases of all kinds were studied in a new light and given radically different treatment. In 1849 and 1850 French scientists showed that the blood of animals who had died of anthrax contained small particles, and ten years later it was discovered that these particles, when introduced into a living organism, would cause the disease. In 1870 it was proved that putrefaction, like fermentation, was due to germs. In the same

year the germ of relapsing fever, one of the most dangerous diseases on the continent, was discovered, and during the decade following there was much further investigation along the same lines.

The germ for leprosy was discovered in 1879, for typhoid fever in 1880, for consumption in 1882 and for cholera in 1884. This last discovery was the greatest discovery of all, and it resulted from the heroic efforts of scientists who went to Egypt to investigate the disease while it was raging there in 1883. But the accuracy of the theory was not generally accepted until 1890. Now we know the cause of the disease, and there can be no excuse hereafter for an epidemic of cholera in any of our cities. When there was cholera in Hamburg a few years ago, the commercial interests of England were of such vast importance that she refused to quarantine her ports against the disease. Hundreds of cases were brought into England, but the disease was so thoroughly understood that it was stamped out as soon as it appeared in every case, and there was no epidemic. To what extent human life in the aggregate has been prolonged by better food and more of it, improvement in sanitation and the advances made in the scientific treatment of disease, can never be statistically determined. But it is certain now that diseases are due to the operation of causes which are pretty well understood. Cities understand that they can no longer afford to have bad sanitation, and these improvements alone mean the prolongation of the working periods of men's lives. —*Insurance Monitor.*

DAMAGE BY LIGHTNING is unmistakably increasing, according to the director of the statistical office of Berlin. Various causes are assigned, such as the employment of electricity in various industries, the continual change of form of the earth's surface by deforestation, drainage, etc., and the impurities introduced into the atmosphere by the growing consumption of coal. Professor von Bezold some time ago showed that for Bavaria the fires due to lightning increased from a yearly average of thirty-two in 1833 to 1843 to one hundred and thirty-two in 1880 to 1882; while the number of persons struck by lightning and of those killed rose from one hundred and thirty-four and seventy-three respectively in 1855 to one hundred and eighty-six and one hundred and sixty-one in 1885. An interesting fact noted is that persons struck generally perceive neither lightning nor thunder, but receive the impression of being enveloped by fire.—*Public Opinion.*

DOES PURE WATER PAY?

THE value of pure water cannot be expressed with absolute definiteness in dollars and cents, first because we cannot say just how many lives and how much sickness it saves, and second because if these facts were known their value could not be told in money terms alone. But while this is true, some figures can readily be presented by the engineer and sanitarian, which may have good effect when water supply or sewage disposal problems are under discussion.

A good instance of what can be done in this line is presented by the following extract from a new book on "Water Supply," by Prof. Wm. B. Mason, of Rensselaer Polytechnic Institute, Troy, N. Y. Prof. Mason has made special studies of the relation between water supply and disease, both in this country and abroad. He writes, under the caption, "Does Pure Water Pay?" as follows:

To abandon an existing water supply system, or to purify the polluted water that it furnishes, always involves the outlay of much money, and the city taxpayer has the right to inquire whether or not the benefit derived is a fair equivalent for the cash expended. Impure water affects the yearly death rate, as a whole, much less than that section of it which deals with diseases recognized as "water-borne," prominent among which is typhoid fever. No better measure can be selected of the wholesomeness of a city supply than that furnished by a list of the annual cases of this serious disease.

Typhoid fever is doubtless, to a very large extent, a preventable disease, but the means of prevention, in the shape of great public works, are expensive, and again the question is asked, Do these works pay? Can we afford to save the typhoid victims?

According to Rochard.

The economic value of an individual is what he has cost his family, the community or the State for his living, development and education. It is the loan which the individual has made from the social capital in order to reach the age when he can restore it by his labor.

The statement of this value in the form of money is a difficult matter which has been variously settled by sundry investigators. Chadwick considers an English laborer equivalent to a permanent

deposit of about $980. Farr gives about $780 as the average value of each human life in England. A French soldier is rated as worth about $1,200.

In view of the fact that typhoid fever selects by far the greatest number of its victims from among those in the very prime of life, to the relative exclusion of the very young and the very old, it will be reasonable to follow the figure fixed upon by E. F. Smith, and place the loss caused the community by a death from typhoid at $2,000. This will be noticed to be less than half the figure so frequently referred to in the courts of this State, for the value of a human life.

For the sake of illustration, let us consider the tax levied annually by typhoid fever upon a city of one hundred thousand inhabitants, for instance, Albany, N. Y. From statistics given in the last five annual reports of the State Board of Health, the deaths due to typhoid fever in Albany average 75 for the year. Rating the money value of each life at the figure given above, this death rate would mean an annual pecuniary loss to the city of $150,000. Funeral expenses are variously estimated at from $20 to $30. Should we accept the intermediate value of $25, this item would cause $1,875 to be added to the above sum, thus raising the total direct loss through death to $151,875.

But typhoid fever does not always kill, its mortality rate is commonly quoted at about 10%. For the present purpose, should we assume nine recoveries for each death from the disease, and place 43 days as the period of convalescence (the average of 500 cases at the Pennsylvania Hospital), we should have a term of 29,025 days as representing the time lost, per year, by the 675 persons who have the fever and recover. Thus an annual loss of over 79 years has to be borne by the city's capital of productive labor.

This great amount of enforced idleness, when translated into money value, should very properly be added to the death loss above estimated.

Fixing the rate of wages at $1 per individual per day, a very low figure, considering that the bulk of typhoid patients are in the very prime of life, there is a loss of $43 of wages for each recovery, or a total yearly loss for the city from this item of $29,025. The cost of nursing and doctors' bills equal at least $25 per case, which is a very low estimate, thus adding the further amount of $16,875 to the gross sum. Expressed in tabular form, this yearly tax imposed by typhoid fever upon the city of Albany is given

below, and, upon a most conservative estimate, it is practically $200,000, which is $2 a year for each man, woman and child in the city, or a yearly tax of $10 for every family of five persons.

75 deaths at $2,000 each	$150,000
75 funerals at $25 each	1,875
Wages of 675 convalescents, during 43 days, at $1 per day	29,025
Nursing and doctors' bills for 675 convalescents at $25 each case	16,875
Total tax levied annually by typhoid fever upon the city of Albany	$197.775

It can readily be seen that public works which could eliminate a reasonable fraction of this great tax would pay for themselves in the course of a few years, even though they were originally expensive.

Finally, it is right to inquire what fraction of the present typhoid loss it would be reasonable to hope to save if pure water should be served in the city in place of its present polluted supply. To answer this question, recourse must be had to statistics obtained from other cities, covering periods before and after better water-systems had been introduced. Such data have been already given for a number of cities and communities, and it only remains to anticipate what will be later said of Munich, and state that improved water and sewerage have reduced the annual typhoid mortality from an average of 25.4 per 100,000 to 2.7.

Surely pure water pays in a city with such a record, and likewise it would pay in the newer, but growing cities on this side of the Alantic. Americans insist upon being supplied with much more water per capita than is usually furnished for Europe, but they are singularly indifferent as to its quality. It would be a reform of great moment if they could be induced to curtail the present enormous waste of public water, such as that of Buffalo, for instance, which is stated to be 70% of the entire pumpage, and to expend the money thus permitted to leak away in a vigorous effort to improve the quality of the water. No such lowering of the typhoid death rate as occurred in Munich, San Remo, and sundry other places could be looked for, perhaps, but a large percentage of the present rate could be cut off, and, we think, from a consideration of the above figures, that such a reduction would pay.

No weight should be attached to the argument, so often advanced by the individual householder, that he and his family "have used the water without evil results for the past fifty years." A single family is too small a collection of units upon which to base any estimate touching the question at issue.

Placing the typhoid death rate for Albany, as above, at 75 annually, it would call for one death in a family of five persons every 261 years, a period much beyond the limit of ordinary family record.—*Engineering News*, June 4, 1896.

IMMUNITY, NATURAL AND ACQUIRED.

J. M. FRENCH, M. D., Milford, Mass.

WHEN Edward Jenner, the medical student, in 1766, heard the casual remark of the milk-maid who had called to consult his master in regard to some trifling indisposition, "I can't take the small-pox, for I have had the cow-pox," his attention was arrested by her careless words, and he revolved them in his mind until he became convinced that they contained the germ of a great discovery. But neither then, nor when, after twenty years of study and experiment on animals, he had the first vaccination in a human being, on the fourteenth day of May, 1796, did he have any conception of the real magnitude of that discovery, or the tremendous import of the act he that day performed. Nor did he in his wildest dreams imagine that, when its primary results should have wrought out, in bringing under control and almost stamping out of existence one of the most dreaded of all diseases, after an incubation-period of one hundred years, the idea to which he had that day first given expression in deeds, should break into new life, and run a fresh course of triumph, revolutionizing the medical practice of the world, and—as we this day have reason to believe, may be the case—saving in its secondary stage thousands and tens of thousands, where in its primary in had saved but tens and hundreds.

Historically as well as logically, vaccination was the foundation of the serum treatment of disease, and the first attempt to produce artificial immunity from a dangerous specific disease, by the substitution of a milder form or a less dangerous disease.

Let us consider for a few moments the general subject of immunity or freedom from the liability to specific infectious diseases, and the means by which it may be secured.

In the first place, certain species of animals, and some individuals of the human race, are not susceptible to certain diseases. For example, goats are not subject to tuberculosis; rats are immune against anthrax; here and there we find individuals who cannot be successfully vaccinated, and who do not take small-pox; others never have scarlet fever, measles or mumps, no matter how often or how fully they may be exposed to these diseases. This is natural immunity.

Acquired immunity from the specific infectious diseases is brought about by undergoing an attack of the disease in question, whether contracted accidentally or communicated by artificial means. Thus, a child who has recovered from an attack of scarlet fever, is usually thereafter immune from that disease. One who has been inoculated with small-pox, has, after recovery been rendered artificially immune thereto. The great objection to these methods of immunization is, that they are accompanied by a great degree of inconvenience, suffering and danger to life on the part of the patient; and not only this, but owing to the contagious nature of the disease, they are full of danger to the community.

The practice of vaccination for the prevention of small-pox, which was introduced through the efforts of Jenner, is but a modification of the method of producing acquired immunity. Its superiority consists in the fact that it substitutes a slight and trifling disease for a severe and dangerous one; and furthermore, that it is not communicable in human beings by the ordinary methods of infection. Whether kine-pox is a disease distinct from small-pox, though similar to it, or the same disease merely modified by passing through the system of an animal less susceptible to it than is man, is a question which is not definitely settled, but with the probabilities strongly in favor of the latter theory.

Another modification of the method of producing acquired immunity, which was brought about mainly by the researches and experiments of Pasteur, consists in the introduction into the system of weakened or attenuated cultures of the virus of the disease, thus producing a mild form of the disease instead of a severe one. The attenuation or dilution of the virus is accomplished by exposure to air, to heat, or to certain chemicals. The symptoms resulting from inoculation with this product he found to be notably less severe than those of the typical disease, while at the same time full future protection was afforded. It will readily be seen that this is but an extension of the principle of vaccination.

Pasteur himself stated the theory by which he explained these results as follows: "To exhaust a soil, a parasite less vigourous and destructive than the really virulent one may suffice; and if, after having by means of a feebler organism, exhausted the soil without a fatal result, the most highly virulent parasite be introduced into the system, it will prove powerless." Chaeran, on the other hand, believed that during the process of immunization, certain bacterial products are formed which are injurious to the microbes, thus rendering a second infection impossible. This approaches more nearly to the later theories than does Pasteur's.

By this time there were a multitude of investigators in the field, and the bacteria of the different diseases were being studied on every side, with the aid of culture fluids, chemical agents and the microscope. It was discovered that the ultimate agent in the production of the infectious diseases is not the germs themselves, but certain poisonous chemical products known as toxins, to which they give rise. It was also found that these toxins could be separated from the germs themselves, and that inoculation with them produced the same results, both as to symptoms and future immunity, as that with the living germs, but without the intervention of any considerable period of incubation. A careful study of the natural history of the resulting processes, led to the belief that under the irritating influence of the toxin, the tissues are stimulated to produce a counter poison, or antitoxin, which is the active agent in the production of acquired immunity. There are two theories as to its mode of action, the chemical and the vital. The former, advocated by Behring, holds that it neutralizes the toxin by a chemical action, and the latter, which is supported by Roux and Buchner, that it destroys the susceptibility of the tissues to the toxin.

While these discoveries were being worked out, it was also observed that healthy blood and lymph possess to a greater or less extent the property of destroying the germs of disease, and that this power differs in degree in different classes of animals and in different individuals. It was shown that this property was the result of certain albuminoid substances which are found dissolved in the blood, and that the serum from an animal naturally immune to a certain disease will destroy more germs than that which is derived from animals very susceptible to the disease.

The next important step in the progress of serum therapy, was the fact established by Behring, that "the blood and blood serum of an individual which has been rendered artificially immune

against a certain infectious disease, may be transferred into another individual, with the result to render the latter also immune, and also if given in sufficient quantity, to bring about recovery after infection with the disease." This is known as Behring's law, and is the fundamental principle in the serum treatment of disease. And this process of immunizing by the direct injection of serum containing antitoxin, is the fourth method of producing acquired immunity, and differs essentially from the previous methods.

The normal blood serum of animals naturally immune against certain diseases, while destroying the germs to a certain extent, does not possess any immunizing properties when transferred to other individuals. Therefore the immunizing agent is not any substance naturally formed in the blood, but instead, a chemical substance, or antitoxin, formed by the tissues in response to the stimulating influence of the toxin, or disease-producing agent.

Acquired immunity, then, is of two kinds, that which is brought on by undergoing a disease, either in its normal or a modified form, and that which is produced by a direct injection of antitoxin. The first comes on only after a certain definite period of incubation, and a regular course of the disease. It remains after all trace of antitoxin has disappeared from the system, and may be either permanent, or persist for an indefinite period. The second makes its appearance immediately, and disappears when the last trace of antitoxin has disappeared from the system.

But immunity, whether natural or acquired, and in whatever way acquired, can be transmitted from one individual to another, only while antitoxin is present in the blood.

The differences between the two forms of immunity, the one caused by an attack of the disease, and the other by an injection of antitoxin, are stated by Aronson as follows:

"1.—The immunity effected by the antitoxin injection appears at once.

"2.—By increasing the amount of the injection, protection against an infection of any strength may be afforded.

"3.—Immunizing is accompanied by no reaction.

"4.—The acquired immunity is of relatively short duration.

Behring sums up the principles of the blood serum therapeutic method thus:

"1.—It is an antitoxic method by which we endeavor to combat those infectious diseases that we know to be of micro-parasitic origin; these include the infectious diseases, and certain vegetable and animal poisons (as make poison). The specific antitoxins,

which are the active agents, have until now been found in quantities sufficient to be available for human medication, only in the blood of immunized animals.

"2.—It is a principle of blood serum therapy that larger doses are never injurious, but on the contrary can be only beneficial.

"3.—The blood serum therapy is a specific therapy. Each blood antitoxin is immunizing and curative for only one infection.

"4.—Under the influence of a specific toxin, there is produced a specific antitoxin from the albumen of the living cell. Whilst this is going on, there is a disturbance of the regulating mechanism of the general organism. The febrile and other symptoms of a toxic infection are an expression of the effort of the living organism to render the foreign body innocuous. In animal experiments we can so arrange things that the living organism succeeds. In immunizing animals we can render the absorption of even larger quantities of the poison harmless by increasing the antitoxin production.

"5.—If we examine the bodily fluids after recovery from an artificial or natural toxic infection, we find not only that the toxin is compensated by the antitoxin, but that there is a surplus of the latter. This surplus is the reason why a larger quantity of the toxin must now be introduced, in order to produce an intoxication. And this surplus can be employed to help other individuals to overcome the same intoxication. The entire blood serum therapy rests on this fact.

"6.—Since these antitoxins are soluble chemical bodies, it is not impossible that they may eventually be produced outside the living body, or compounded synthetically."—*Medical and Surgical Reporter*, June 6, 1896.

NUTRITIVE VALUE OF CORN MEAL.—Professor Atwater, who has for many years been engaged in investigations relating to foods for the United States Department of Agriculture, has been led to the conclusion, as the result of exhaustive studies on the subject, that, considered from an economical standpoint, corn meal has the highest nutritive value of all foods. Ten pounds of corn meal contain more than eight pounds of actual nutriment, while the same quantity of potatoes possesses but three-fourth pounds of nutrient material.—*Modern Medicine.*

PROF. ATWATER'S INVESTIGATIONS are published in considerable detail in THE SANITARIAN, vol. 36—March and April numbers.

INFECTED ATMOSPHERE.[1]

By GUY HINSDALE, M. D., of Philadelphia.

THE air we breathe is a fertile subject for scientific investigation. Besides the floating matter in the atmosphere, embracing many germs that are well-known to be virulent, it has been commonly believed by physicians and sanitarians "that the discomfort and dangers to health and life which had been known to exist, sometimes at least, in unventilated rooms occupied by a number of human beings, were largely or entirely due to peculiar organic matters contained in the air expired by these persons, and that the increase in carbonic acid due to respiration had but little effect in producing these results, its chief importance being that it furnished a convenient means of determining the amount of vitiation of the air." In this connection I take the opportunity of calling attention to the latest researches on this subject, just published as one of the "Smithsonian Contributions to Knowledge," by Drs. John S. Billings, S. Weir Mitchell, and D. H. Bergey of the Laboratory of Hygiene of the University of Pennsylvania.

Experiments hitherto have reported various results, but the majority have, of late, denied that the exhaled breath of healthy human beings, or of animals, contains a poison or organic alkaloid, or any poisonous product other than carbonic acid.

Dr. Bergey began by causing a man to breathe for from twenty to thirty minutes so that the expired air should pass through sterilized melted gelatin, which was then preserved as a culture for from twenty to thirty days. In the first trial six, and in the second two colonies of common air organisms developed; but when special care was taken to thoroughly sterilize the vessels used, the result was that in two consecutive trials the gelatin remained sterile. Epithelial scales and other matters were sought for by condensing the vapor of the exhaled breath and examining the product with the microscope. In six preparations thus made no bacteria or epithelial cells were found.

Experimenters in this field find that in one day a healthy man will exhale over a thousand gallons of air, and from six to twelve ounces of moisture. There is more or less ammonia in the product

[1] Delivered before the Class of Nurses in Training at the Orthopedic Hospital and Infirmary for Nervous Diseases, Philadelphia.

exhaled, the more where the teeth are allowed to decay and proper cleanliness is not observed. In examining the breath from a consumptive Dr. Bergey found that the fluid contained a smaller proportion of ammonia, and a larger amount of oxidizable matter than did fluid similarly collected from a healthy man. No organic alkaloids were found.

It was found in attempting to condense the moisture of the air of hospital wards that the placing of a dust filter in front of the condensing apparatus causes a marked reduction in the proportion of ammonia in the condensed fluid.

Drs. Billings, Mitchell and Bergey made a series of experiments by injecting into animals the fluid condensed from the air expired by healthy persons, and also by a man, whom you may remember to have seen in our clinic, whose larynx has been removed, and who breathes through a tracheal fistula. In the last case the possibility of contamination of air in the mouth was of course excluded. The injections were made into the general circulation in rabbits, guinea-pigs, and white rats. The result of the subsequent examination showed that there was no special disease or degeneration in the organs of these animals; in other words, there was no organic poison.

The conclusion from this experimental work is that the injurious effects of air expired by healthy animals and men are due entirely to the diminution of oxygen, or the increase of carbonic acid, or to a combination of these two factors. It would appear also quite improbable that the minute quantity of organic matter contained in the air expired from human lungs has any deleterious influence upon men who inhale it in ordinary rooms, and hence it is probably unnecessary to take this factor into account in providing for the ventilation of such rooms.

The experiments showed, secondly, that in ordinary quiet respiration no bacteria, epithelial scales or particles of dead tissue, are contained in the expired air. But in the act of coughing, or sneezing, such organisms or particles may probably be thrown out.

Thirdly, the ammonia exhaled is chiefly due to the products of decomposition of organic matter, which is constantly going on in the mouth and pharynx.

Fourthly, the air of hospital wards was found to be contaminated chiefly by minute particles—dust. This contained micro-organisms capable of producing inflammation and suppuration.

Fifthly, no peculiar volatile poisonous matter in the air expired by healthy men and animals was found, save carbonic acid.

It was also found in these investigations, as in others preceding them, that animals may be habituated to an atmosphere so vitiated by a loss of oxygen and an increase of carbonic acid, that a similar animal brought into it from fresh air dies almost immediately. It would appear that immunity to vitiated air may exist normally in certain mice, or be produced in them. It would be an interesting research to determine what races of men can endure the greatest foulness of atmosphere. One who reads the testimony of Arctic explorers, from Dr. Kane to Caspar Whitney, cannot fail to be impressed by the tolerance which the Esquimaux Indians show in this regard.

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In the excessive cold of the Arctic regions the consumption of oxygen increases as the temperature diminishes, and the demand for oxygen is more urgent than in temperate climates. Drs. Billings, Mitchell and Bergey say that the proportion of increase of carbonic acid and of diminution of oxygen, which has been found to exist in badly ventilated schools, theaters, or barracks, is not sufficiently great to satisfactorily account for the great discomfort which such conditions produce in many persons, and there is no evidence to show that such an amount of change in the normal proportion of these gases has any influence upon the increase of disease and death-rates, which statistical evidence has shown to exist among persons living in crowded and unventilated rooms. The causes of the increased death-rate under these circumstances are chiefly pulmonary tuberculosis and pneumonia arising from the access of the infected dust to the air passages. It is also pointed out that impure atmosphere may affect the vitality and bactericidal powers of the cells and fluids of the upper air passages with which they come in contact, and may thus predispose us to infections, the potential causes of which are almost everywhere present, and especially in the upper air passages and in the alimentary canal of even the healthiest persons. Whether such be the cause or not, we do not know; future studies may enlighten us.

The recent observations[1] of Dr. Irwin H. Hance at the Adirondack Cottage Sanitarium ought to dispel some of the ill-grounded fears of the danger of contracting tuberculosis by mere contact with patients suffering from this disease. Needless prejudice has no doubt been aroused by ignorance of the precise manner in which tuberculosis may be communicated and hardship entailed

[1] *Medical Record*, New York, December 28, 1895.

on the unfortunate subjects. We know that hospitals, private dwellings and conveyances do become infected, but we doubt if the patient infects by mere contact, much less by his breath. It is through the sputum, when dried and distributed through the atmosphere, that the chief mode of infection operates. Dr. Hance quotes the investigations of Celli and Guarnieri, who found the expired air of tubercular patients free from tubercle bacilli, and also that air blown by a bellows over and through sputum very rich in bacilli remained free from these germs. Seven other experimentors made similar observations. For two months Tappeiner[1] caused a woman with advanced phthisis to cough through an opening into a wooden box in which were two guinea-pigs; at the end of that time they were killed and found to be sound.

I report Dr. Hance's observations as they are of great practical value to a proper understanding of this subject. Dr. Hance examined the dust taken from eighteen buildings belonging to the sanitarium, some of these having been occupied for eleven years by consumptives. The dust was taken from the darkest and most likely to be infected spots. The first group of four buildings consisted of the main building (parlor, sitting-room, and public library); the infirmary, where all the acutely sick are sent; the oldest cottage and the most recently built cottage. From each of the remaining thirteen cottages a half a square yard of dust was taken and ten guinea-pigs inoculated. These inoculated animals were kept from one to three months and then killed and microscopically examined. Five were found to have had tuberculosis, four others having died on the third to sixth day of other infectious diseases. The five that had tuberculosis constituted just one half of the number of pigs inoculated with dust from the oldest cottage on the grounds, accomodating two patients, always advanced cases, one of them having been complained of by his roommate for spitting around the cottage.

It was thus scientifically proven that in this case carelessness and disobedience of rules, which a weak and sickly man is prone to break, were responsible for the infection of a cottage, thereby rendering it dangerous to himself and others.

On the other hand, the remaining sixteen buildings, some of which had been occupied for ten years by consumptives, were absolutely free from infectious material.

Such, then, are the results in a sanitarium favorably located in

[1] *Archiv f. Med.*, Bd. xxix, S. 59.

the Adirondack Mountains, presided over by one who is giving the best years of his life to the scientific treatment of tuberculosis, at the bedside and in the laboratory.

But what may we expect to find in the city hospital, where clouds of dust sweep over us from we know not where, and smoke from factories and locomotives poisons the atmosphere?

Cornet collected dust from the walls and headboards of beds in seven of the hospitals of Berlin where phthisical patients were treated, and inoculated ninety-four animals. Fifteen out of twenty-one rooms furnished tuberculous matter. Of the ninety-four animals fifty-two died of other diseases; of the remaining animals, killed after forty days, twenty were tuberculous and twenty-two were sound. Tests of dust from the walls of houses of fifty-three private patients affected with tuberculosis were introduced into 168 animals, of which ninety died soon after the injection, thirty-four were found tuberculous, and the remainder sound. In the aggregate about one-fifth of the animals submitted to these tests were found to have become tuberculous. If acute intercurrent disease could have been avoided the proportion no doubt would have been still greater, as many animals died of some acute infection within two or three days. Cornet found that in no case was the dust infectious when gathered from rooms where cups and cuspidors were used exclusively to receive the sputum. We have seen that here again Dr. Hance has corroborated Cornet's result.

Dr. Hance examined the dust from the wards of a large city hospital occupied by tuberculous patients of both sexes. Out of nine pigs inoculated, five died of acute infection within three days. The four living pigs were killed at the end of sixty days and one had well-advanced tuberculosis.

Nurses, as a class, are unquestionably very liable to contract phthisis, but I do not believe that in this country the liability is anything like what is said to exist in Europe. The religious orders throughout the continent supply nurses for most of the large hospitals, and it is no doubt true that close confinement in convents, and the subsequent hard work and exposure to disease, renders them an easy prey to tuberculosis. It has been said that an examination of the records for twenty-five of thirty-eight European nursing societies, sixty-two per cent. died of tuberculosis. These records gave the cause of death in four thousand of the members.

I do not know that any one has made investigation of the causes of death among American nurses in general; it is an im-

portant subject for study. We have it, however, on the authority of Dr. Herman M. Biggs, that in one of the New York hospitals as many as eleven nurses and orderlies, previously healthy, had been dismissed within a little more than two years because suffering from tuberculosis. It was an overcrowded and poorly ventilated institution.

In our own homes few have marble floors and steam heat, and painted walls are not looked upon with favor. We can, however, make a warfare against dust. A hardwood floor is conducive to health, because it quickly shows the presence of dust or dirt, and can easily be kept clean. But, best of all, we have sunlight. The tubercle bacillus is one of those imps that loves darkness rather than light, because its deeds are evil. There is no disinfectant so potent against tubercle bacilli as bright sunlight. The sunniest spots are the safest. In choosing a home avoid shadows from trees or high buildings; avoid dampness, especially dampness of the soil, and above all make inquiry as to previous occupants, whether in your home or in your hotel, and if tubercular disease has been present, and no proper disinfection or supervision of the patient has been practised, see to it that the quarters are put in proper order or secure others.—*Medical News*, May 2, 1896.

THE EFFICIENCY OF LIGHT.—As light is a form of energy, its efficiency, with reference to the energy from which it is generated, admits of calculation if the data are at hand. If the light is that of an incandescent lamp, by measuring the amount of electrical energy supplied in a given time and the amount of heat given off in the same time, the difference will give the amount of energy transformed into light. It has been found that but from three to five per cent. of the energy supplied to an incandescent lamp is transformed into light. In other words, while an efficient 16-candle power incandescent lamp of the present day consumes fifty watts of electrical energy, but from 1.5 to 2.5 watts are transformed into light, the remainder being wasted and appearing in an obnoxious form as heat at the lamp. The field thus offered for improvement is the greatest and most tempting in the entire range of science, and the inventor who succeeds in producing light with the accompaniment of but little heat will have a royal reward. In the fire-fly nature has given a solution to the problem.—*American Electrician.*

SLEEPLESSNESS.

By Frank P. Norbury, M. D.

It is unfortunate that the physiology of sleep is not better understood. It is even more unfortunate that what we do know about the phenomenon of sleep is not more diffused among the profession. How frequently indeed, do we observe physicians who mistake unconsciousness for sleep, and who seemingly regard the goal of the application of their therapeutical measures, as having been reached, when they have succeeded in rendering a tired, worn out, nervous individual oblivious to his surroundings by placing him in a condition which they call sleep, but which is, simply unconsciousness. An experience of several years in insane hospital practice presented to the writer, in a very strong light, the enormity of this error and its wide prevalence. It was no uncommon sight, to see patients brought to the hospital in an unconscious state, due to the administration of narcotics; opium or morphine being the favorite drug used. One case is worthy of mention here, a male, neurasthenic, harmless, but suffering from the exaggerated mental symptoms, so marked in this disease, was accompanied by his physician to the hospital. The physician stated his reason for coming was, that he considered it important to keep his patient asleep, so that he would not appreciate the humiliation of entering the hospital, and further, that, inasmuch as he had not been sleeping well for some time, and that he was now sleeping, he considered the opportunity a good one, to let him recuperate. To this end, the physician was at intervals giving hypodermic injections of morphine, and the poor, worn-out, narcotized patient, saturated with morphine, and believed to be asleep, was, as best he could, with his worn-out nervous mechanism, fighting for his life, which his respiration, weak pulse and inhibited reflexes, showed was at very low ebb. This case was not an exceptional one; alas, too common an experience. The physician had lost sight of the very essential principle which should govern our therapy in the treatment of sleeplessness, and that is, that sleep has for its object the repair of the wear and tear of vital processes of life, and to insure sleep we must not interfere with these processes, which we do when drugs are given until sedation results.

There is another thing to bear in mind in the consideration of sleeplessness, and that is, that there is a source of irritation somewhere in the economy, which, if relieved, will be followed by sleep. Again, "an axiom" well worth remembering, is, that the more gentle the means employed to induce sleep, the more natural will be the sleep induced, and the more gentle the means employed, the more careful must we be to select the right time for their use. We believe that Dujardin-Beaumetz was right when speaking of the use of drugs in the treatment of sleeplessness; he said: "That for a drug to be hypnotic, it must imitate the natural condition of sleep, by effecting a lowered intra-cranial pressure and that drugs which, though bringing about unconsciousness do not lower cerebral pressure, or which increase it, cannot claim to be hypnotics. Opium and morphine are objectionable on this ground. Drug treatment must put the patient in a position to go to sleep in a natural way, and not *put* him to sleep." Sedatives do this, but narcotics do not.

In the use of sedatives we must be cautious and not use them *ad libitum*. The writer in a paper on "Sedatives in the treatment of Insanity" (1892, *Hospital Bulletin of Minnesota*), said, "Each case is a 'law unto itself,' and as such requires patient and persistent study ere we commit the folly of giving a hypnotic, when more simple and efficacious methods would produce satisfactory results." You cannot cure sleeplessness by drug treatment; the drugs simply conserve nervous energy and act as valuable assistants to the building-up process, necessary to cure the sleeplessness. Sedatives act, as before stated, by placing the patient in a position to go to sleep, and nature does the rest.

In our experience we have learned to rely upon the bromides, chloral, cannabis indica and hyoscyamus as sedatives, which, if judiciously used, bring order out of chaos. The bromides lower the sensibility of the brain, and thus promote sleep. The single salts can be used, but in the writer's experience, where a sedative is indicated in sleeplessness, it is better to combine them, and when there is any excitement, add chloral. Cannabis indica is a sedative which is but little used by the general practitioner, and for the reason that it is misunderstood, misrepresented, and as a result never used as it should be. Clouston, Mattison and Echeverria have taught us their value. Hyoscyamus is another sedative, the value of which is not appreciated, a drug which is endorsed by Budde, Brush, Krafft-Ebing as a hypnotic. Now, these valuable sedatives, when combined, give us a thoroughly reliable and

satisfactory agent, with which to treat sleeplessness, and in the writer's experience no more elegant or reliable preparation is before the profession than that of bromidia, in which is combined in proper proportion, the bromide of potassium, chloral hydrate, hyoscyamus and cannabis indica. We feel that the profession can always rely upon this combination and find it especially useful in the treatment of sleeplessness.—*The Medical Fortnightly.*

UTILITY OF FORESTS.—The report of the Chief Fire Warden of Minnesota for 1895, closes with a statement of the utility of the forests and argument for their preservation.—The Minnesota forests are a great natural reservoir of moisture feeding hundreds of streams, which fertilize the soil and turn the machinery of manufactures. They afford an important industry and home market for agricultural supplies. The pine forests should also be valuable as health resorts, for it has been conclusively shown by scientific observations that forest air is much richer in ozone than the air of open countries.

The Forest Preservation Act makes it the duty of the Chief Fire Warden to "investigate the extent of the forests of the state, together with the amounts and varieties of the wood and timber grown therein," and to include such information in his annual report. This is a very important work, but to do it thoroughly would require much time and the means to employ competent persons to make an actual examination of the timber in the woods. No such means have yet been provided and all the information that can now be furnished as to the extent of the forests and the amount and varieties of timber growing therein is a conservative estimate, based, in part, upon information received from many owners of timber land, from some examination of plats and field notes of the public surveyors, from estimates of fire wardens, from consultations and correspondence with timber land experts, and gained by visits during the past forty years. Estimates are given of the amounts of the various kinds of standing timber in twenty-three counties separately. The total amount of white pine is estimated at 14,424,000,000 feet, and of red or Norway pine, 3,412,475,000 feet. In twenty-three counties there are 10,889,000 acres of natural forest, and in the whole state there are 11,890,000 acres of natural forest, not including mere brush and swamp land. The annual cut of pine for each of the past three years is estimated at 1,500,000,000 feet. The consumption of merchantable hard-wood lumber in Minnesota is estimated at 100,000,000 feet annually.

"WHAT FOOLS THESE MORTALS BE!"

WHEN the Bard of Avon thus wrote he doubtless had in mind the average physician. The business depression which has existed for so long that memory of man runneth not to the contrary, has hit the doctor probably to a greater extent than anyone else, not even excepting the lawyer. The cry in the medical land is, Hard times! Families have to be reared and rent must be paid, and the butcher and the baker expect their pay for the sustenance bought of them, and the doctor groans as he looks at the wrong side of his ledger and wonders why Mr. ——— does not pay him for the babe brought into the world or for the appendix successfully excised.

Meantime the great charities of the country, the hospitals, are erecting new and costly edifices and ultra-expensive operating-rooms, in order that the paupers, so called, may be fitly housed, and, where the need exists, operated upon amid surroundings such as a monarch of the effete dynasties of the Old World would be glad to occupy as a dwelling. The doctor and the surgeon make their rounds in these palatial abodes, giving drugs here and wielding the knife there, spending hours of time and years of brain-work in alleviating the sufferings of the inmates. The superintendent of these hospitals is amply paid, the ward-tenders and the nurses, and even the lawyer, when it becomes necessary to employ one, and the doctor and the surgeon receive—*nothing* except experience! It is impossible to pay the butcher and the baker and the landlord *nothing*, and yet year in and year out we find the medical profession catering to the desires of the incorporators of these too frequently misnamed "charitable" institutions—misnamed in that scarcely any discrimination is shown in regard to the sufferers admitted, for whom the enormous amount of money has been expended in buildings and in fittings, while the doctor, the man who after all should be paid the highest, gets nothing but experience!

Now would not the times be less hard if the profession with united voice would insist on those who incorporate these palatial abodes realizing that they are as nothing compared with the man who endeavors to cure disease and to eradicate ills? Why should not the hospital surgeon receive his adequate reward, from a financial standpoint, from private incorporated hospitals, even as does the lawyer when employed, or the minor attendants who give their time and their skill within the walls? All this carries

no implication of lack of charity. It is not the pauper who is going to pay, but the wealthy men and women who lend their names and give of their abundance toward the erection of these hospitals. To go a step further, should not the State remunerate the physicians who faithfully serve the real paupers? The principle which underlies the existing state of affairs is wrong from its foundation, and the time is opportune for physicians to mass together and insist on remuneration adequate to the mental anxiety, the skill, the time spent in attending even to the poor in institutions. Sweet charity is a term of glorious meaning, but it in no sense calls upon a body of men for the amount of sacrifice which medical men constantly make, without reward here, except possibly a little fame, whatever the future may hold out to them. The profession of medicine is indeed the noblest of all, but man cannot live and support a family on such record; and even as it is the duty of the State to care for its paupers, even so should it become the duty of the State to properly remunerate those without whom it could not care for them.

What fools these mortals be! In no profession aside from medicine is it the custom not to expect prompt payment for services rendered, and yet how many professional men infuse even an iota of business methods in the collection of their accounts? Because, forsooth, certain professional men, born with gold spoons in their mouths and therefore not obliged to give thought to the morrow, have set the custom of rendering quarterly, half-yearly, or even yearly accounts, the rest seem to follow like so many sheep, for fear of antagonizing patients. All this is wrong and inconsistent with those business methods which are at the bottom of successful breadmaking. Only the man with ample capital can afford to wait six months for payment of accounts. The average doctor is fortunate if he have enough in bank to tide him over one month, and therefore the need of prompt pay for prompt and efficient service. The man who owes the doctor a bill is the doctor's enemy until the bill has been paid. He is most likely to pay it promptly while the feeling of gratitude for service rendered is present to its fullest degree, and, furthermore, if the truth were known, the average layman is glad to know monthly what the exact amount of his indebtedness is. Again, were prompt payment made for prompt service, the chances are that both layman and doctor would be the better off, in that it would not be necessary for the one to hesitate to send for his medical adviser early in the course of a disease, lest he should respond grudgingly, the

bill being unpaid; and the latter would be the better off, in that his efforts at cure would not be so frequently nullified by the fact that he is called long after the disease has made progress beyond the reach of skill or drug. The medical man would suffer the less from want and anxiety during his lifetime, and he would less frequently leave his wife and children in want when his life is sacrificed, possibly through very devotion to some critical case, were he expected to send his statements in promptly, and were it evident that he insisted upon being paid the *first* instead of, as is the custom, *last* or *not at all.*

In other respects these mortals be fools, but mostly because they themselves help charity to be abused and forget that charity of the ripest type begins at home. The infusion of business methods into the practice of medicine does not rob the profession of one jot or one tittle of nobility, but, on the contrary, adds to its common sense. There is ample room for both common sense and charity of the right sort in this world of the medical man; and when he ceases to make a fool of himself after the fashion dwelt upon, he will have more time for charity, particularly that kind which cares for the present and the future of those dependent upon him.—*American Medico-Surgical Bulletin.*

SLEPT IN THE HEN-COOP.—"Papa, is Mrs. Bigelow very poor?"

"No, Cedric, Mrs. Bigelow is well off; don't you know, what a nice house she has?"

"But she sleeps in the hen-coop, papa."

"Why, Cedric!"

"She said, she did."

"What do you mean?"

"Don't you remember when she was here to dinner night before last she excused herself, and said she must go home early because she went to bed with the chickens?"—*Harper's Round Table.*

OLD AGE CONDITIONAL.—Physician (Examiner for a Life Insurance Company)—"How old are you?"

Irishman—"Twanty-five."

"Your parents are living, I suppose?"

"No, sur, they're dead."

"What did they die of?"

"Ould age, sur."

"How old were they?"

"Forty, sur."

"Do you think a person of forty dies of old age?"

"In the ould country people die young of ould age."—*Life.*

RELATIONS OF MEDICAL EXAMINING BOARDS TO THE STATE, TO THE SCHOOLS AND TO EACH OTHER.

DR. WILLIAM WARREN POTTER, of Buffalo, president of the National Confederation of State Medical Examining and Licensing Boards, chose this title as the subject of his annual address at the sixth conference of this body held at Atlanta, May 4, 1896.

He said there were three conditions in medical educational reform on which all progressive physicians could agree—namely, first, there must be a better standard of preliminaries for entrance to the study of medicine; second, that four years is little time enough for medical collegiate training; and third, that separate examination by a state board of examiners, none of whom is a teacher in a medical college, is a prerequisite for license to practise medicine. It is understood that such examination can be accorded only to a candidate presenting a diploma from a legally registered school.

He further stated that a high school course ought to represent a minimum of academic acquirements, and that an entrance examination should be provided by the state for those not presenting a high school diploma or its equivalent.

He did not favor a National Examining Board as has been proposed, but instead thought all the states should be encouraged to establish a common minimum level of requirements, below which a physician should not be permitted to practise; then a state license would possess equal value in all the states.

In regard to reciprocity of licensure, Dr. Potter thought it pertinent for those states having equal standards in all respects to agree to this exchange of inter-state courtesy by official indorsement of licenses, but that other questions were of greater moment just now than reciprocity. Until all standards were equalised and the lowest carried up to the level of the highest, reciprocity would be manifestly unfair.

He urged that the states employ in their medical public offices none but licensed physicians. This, he affirmed, would tend to stimulate a pride in the state license, and strengthen the hands of the boards.

He denied that there was antagonism between the schools and the boards, as had been asserted. He said that both were working on parallel lines to accomplish the same purpose, that there could

not possibly be any conflict between them and that they were not enemies but friends.

The medical journals of standing from one end of the country to the other, he affirmed, were rendering great aid to the cause of reform in medical education, and the times were propitious.

He concluded by urging united effort by the friends of medical education saying that "the reproach cast upon us through a refusal to recognize our diplomas in Europe cannot be overcome until we rise in our might and wage a relentless war against ignorance, that shall not cease until an American state license is recognized as a passport to good professional standing in every civilized country in the world."

MEDICAL EXCERPT.

By T. P. CORBALLY, A. M., M. D.

SERUM THERAPY continues to be a subject of lively discussion in the profession abroad. In the February number of THE SANITARIAN an abstract of a report to the Academie de Medecine on the Mortality from Diphtheria since the introduction of the Serum Treatment, by M. Henri, was published; and in the December number preceding, an abstract of a paper, by MM. Richet and Hericourt, on the value of the Serum Treatment for Cancer.—Le Progres Medical of May 30, reports a recent discussion of some disputed questions in the serum treatment of diphtheria with adjuncts, by Professor Felatoff of Moscow, as follows

Some have advised the importance of local applications. Some have also advised the application of plaster of Paris bandages around the tonsils, and with it have recommended the employment of the serum treatment; others advise the application of disinfecting bandages, but non-irritating; others again insist, not only on the necessity of applying caustics locally, but propose even to tear off the false membrane.

M. Felatoff treats diphtheria with injections of serum and also uses bandages of sublimate of the strength $^1/_{1000}$: against the bacilli. He condemns the treatment with toluol of Loefler and especially the forcible removal of the false membranes, and expresses a decided preference for the serum therapy without the least restriction. And he adds that it is in the villages that this treatment is most undoubtedly necessary.

The value of prophylactic injections has also been studied by the eminent professor of Moscow. From the statistics supplied from many of the departments of Russia it has been found that in the infected villages, 50% about of the children not subjected to prophylactic injections have contracted the disease.

As to the question whether albuminuria can be caused by the serum, he does not think it definitely settled. He admits, however, that this result, when it follows, may be referred either to some peculiarity in the horse from which the serum has been obtained, or else to some predisposition on the part of the child into which the liquid has been injected.

In severe cases of diphtheria the Liquor Ferri Subsulphatis—Monsel's Solution—has been satisfactorily applied with pencil dilute or in full strength, to prevent the accumulation of false membrane, or to remove it if collected in large quantities. Nearly twenty years ago a female patient about twenty-five years of age had a very severe attack whish lasted several days and threatened suffocation. In consequence of the tendency to extend, the late Professor J. C. Hutchison, of Brooklyn, objected to tracheotomy. The throat was penciled freely, and a mixture:

Tinct. Ferri Subsulphatis	ʒ iss
Ext. Jaborandi fld.	ʒ iiss
Syr. Limonis	℥ iss

To be given xv or xx drops every hour.

The next day the patient had thrown off the membrane from the fauces and the coverings of the tonsils and uvula. They resembled the tips of fingers of small gloves and are still preserved. Large doses of whiskey were given at short intervals without perceptible effect on heart or brain; but the crisis past, she refused to take more. She is still living and in good health.

COCAINE AS AN ANESTHETIC.—Reclus has made to the Academie de Medecine a very earnest appeal (Gazette Hebdomadaire, of May 24th), in favor of the use of cocaine as an anesthetic. This substance, used in subcutaneous injections, produces a degree of anesthesia sufficient for a great number of operations. M. Reclus has employed it for about ten years, and has made with its use, more than 3,500 operations, without any accident whatever.

Gaiacol, which is recommended by Lucas-Championniere, is far from giving better results than cocaine.

M. Reclus has studied gaiacol and cocaine, and made many experiments on their comparative value. In employing, simultaneously, both of these agents for anesthesia, in each half of the

region on which he was about to operate he has been able to determine that the sensibility was always abolished in the location in which the cocaine was applied, but was not abolished, or was very much less so, where the gaiacol was introduced. From the repeated experiments made, at different intervals, and applied according to the method pointed out by M. Lucas-Championniere, M. Reclus thinks he is justified in affirming again the superiority of cocaine as a local anesthetic.

"It has been charged, he said, against this agent, that it has caused many accidents, but, as I have already shown, they were in all cases attributable to the operator and not to the medicament. All such accidents may certainly be avoided, if the method so often and so earnestly recommended by me is followed. This caution consist in using a solution no stronger than 0,01, and in never exceeding the total amount of gr. 0,15 to gr. 0.20 of cocaine; never to operate unless the patient be in the recumbent position, and, finally, always to avoid introducing the medicine into a vein, which is very easily done if the operator is careful to keep the point of the needle just under the skin.

"It is by observing these precautions that I have been able to perform 3,500 operations of various kinds, not only without a single accident, but I have even avoided any of the troublesome physiological accidents, syncopy and vomiting, so often a cause of complaint.

"I employ cocaine exclusively in cases in which I can arrange in advance the different steps of the operation, and when the extent of the operation is not too great. That is to say, I do not use it in surgical cases involving the abdominal regions, nor in amputations of the limbs. And yet, if there should occur, in such cases, anything contraindicating the use of chloroform or aether as an anesthetic, I would not hesitate to use cocaine, and, under such conditions, I have amputated an arm and a fore-arm by using cocaine."

M. Reclus has complained very seriously of his want of success in making friends for his favorite anesthetic, but he attributes the failures which have prevented surgeons from following his suggestions to the want of careful management in the use of the anesthetic.

SCARLATINA.—M. Apert made a report to the Societe Medicale des Hopitaux on the cases of scarlatina treated in the hospital "des enfants malades," in 1895 (*Gazette Hebdomadaire*, May 17th.) The mortality was 5.85.

The treatment in these cases was limited to a milk diet, almost exclusively, the administration of acetate of ammonia, during the eruptive stage; the dose being from one (1) to two (2) grammes a day, to washing the mouth with boiled water and the injection of oleo-menthol into the nasal fossal, sa as to insure complete asepsis of the cavities.

Children suspected of having diphtheria were treated with injections of the serum of Roux. Injections of the serum of Marmoreck seemed to be of little use.

Of 96 cases of scarlatina, treated with the serum of Marmoreck, in the hopital Trousseau, 8 died; a mortality which showed that the serum had little value in those cases.

It is not probably even a preventive for a great number of the patients in whom it had been used, suffered from anginas, rheumatism, otitis, and other complications.

REMOVAL OF A CEREBRAL TUMOR.—This important operation which required a minute acquaintance with the topography of the part of the brain in which the tumor was located, was successfully performed according to a report made by M. Broca in the *Semaine Medicale:*

The operation was performed in the month of March, last, on a man thirty-one years of age, who was admitted to the hopital St. Antoine a few days before with the characteristic symptoms of a cerebral tumor: excruciating and continuous cephalalgia, located in the lower parietal region of the left side, and darting, when the exacerbations occurred, into the corresponding region on the opposite side; insomnia, vomiting and progressive amblyopia. There was no disturbance of the general sensation, no irregularity of the movements, except a slight tendency to incline towards the right, and a slight tendency to balance the brain. There was also remarked a certain degree of verbal amnesia, especially for proper names, and a little sensorial paraphrasis. The acuteness of the hearing was notably diminished on the left side. In February, a hypothermic crisis set in, without the premonitary aura and without convulsive phenomena.

This accident led M. Brissaud to decide on trephining. The absence of disturbance of locomotion and of true aphasia was sufficient to enable him to locate the lesion behind and below the groove of Rolando. The disturbance of speech, the sensorial changes, the total absence, or at least an absence extending over a long time of the hemianopsia showed that the tumor was located

at the extremity of the fissure of Sylvius, below the curved fold and above the temporal lobe, perhaps reaching over both regions.

Besides the precision with which the patient located the seat of the cephalagia above and behind the mastoid apophysis, confirmed the hypothesis of its location at the extremity of the fissure of Sylvius.

The lines corresponding with the fissures of Sylvius and Rolando having been determined, a cross with nitrate of silver, indicating the curved fold which was considered as the postero-superior limit of the field, the parts below and in advance of this cross above the mastoid apophysis an opening of 7 centimetres long by 5 in height was made on the 31st of March, then the skin was sutured without drainage. Within the area of the part trephined, the blood supply and the color of the dura mater were normal, but it had a decided tendency to curve upwards, and in endeavoring to press it down, the finger felt an abnormal resistance.

The second part of the operation was made on the 2d of April. The wound having been opened, a crucial incision was made in the dura mater, and the brain was exposed; its appearance was normal. In the lower portion of the incision a tumor was felt resting on the temporal lobe. The superficial part was then incised parallel to the sagittal line, and, at the depth of a centimetre, a hard mass of reddish color, apparently limited, but still of considerable dimensions was found so that it could not be enucleated in one piece without enlarging too much the solution of continuity of the bone. The neoplasm was divided with a large curette, and, after having been divided along the middle of its length, it was removed in two large masses. The space was filled with a tampon of iodoform gauze, and the skin sutured, leaving only an opening for the tampon. The last operation lasted just half an hour.

The cephalalgia has completely disappeared, and there is a marked diminution of the amblyopia; there is also a rapid and progressive diminution of the sensorial paralysis and of the slightly marked amnesia for proper names.

EDITOR'S TABLE.

Sanitarian, July Number, 1896.

☞ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y

DUTIES OF LOCAL BOARDS OF HEALTH AS POPULAR INSTRUCTORS.

The following abstract of a paper by Arthur R. Reynolds, M.D., of Chicago, read at the Convention of Illinois State Board of Health Auxiliary Sanitary Associotion, at Springfield, Ill., May 22, 1896, is not only eminently worthy the attention of those to whom it is particularly addressed, but it may be read with profit by all who would observe the most important precepts promotive of both personal and public health.

There is no question upon which the public is so eager for knowledge as the one that affects their health, or gives them promise of lengthened days. Local boards of health because of their official position, are given a very attentive hearing on any question affecting the health of individuals or communities and should speak with care and precision. Instruction should be in the direction of the prevention of disease rather than its treatment. Instruction is needed to prevent the public from swallowing all kinds and conditions of proprietary medicines simply because some advertisement recommends them. It may be true of many that suffer from this habit that they improve while taking the nostrum, but they give the dose the credit and forget that a kindly Providence may have a hand in the charge that has come over them. Careless physicians are not without some share in the responsibility for this enormous error, for they are still prescribing remedies simply to satisfy the minds of patients and give the semblance of value received for the fee charged. These prescriptions range in frequency of dosage from sulphur and molasses given annually in the spring to candied crumbs given away every fifteen minutes.

Dangers in Impure Water.

Local boards should instruct the public frequently of the dangers that lurk in the use of impure water. They should teach that most of the lakes and streams in the country are more or less polluted already, and as the population multiplies the danger of further pollution will greatly increase. They should teach that water that comes from wells and springs is not necessarily pure, for it may flow from a soil that is polluted. They should teach that

neither mechanical filtration nor boiling is wholly satisfactory, for filtration does not remove all the poisons and boiling only destroys the living poisons, while neither removes the lime or any of the salts it may contain.

Local boards may safely teach that the only absolutely pure water is that purified by nature's process—the distillation by solar heat—and given to man from the clouds. It might be well to instruct the public how distillation can readily and cheaply be done. It furnishes a fruitful field for the genius that will devise a small distilling apparatus for the use of every family.

It would be safe to teach that the generous use of pure water, both within and without the body, has never yet done any harm; that the functional ailments that afflict the great host of mankind are in great part due to the fact of imperfect elimination of waste matter, and that generous libations of pure water are a most potent agent to flush them from the body, through the skin, the lungs, the kidneys and the bowels.

Nature's Disinfectant.

Local boards should proclaim so vigourously and so often that all will hear and understand that sunlight is nature's great disinfectant and germ destroyer, and should teach the danger that comes from shutting it out from homes and offices—that every living-room, whether in city or hamlet, should have an outlook both to the earth and to the sky.

The dangers that come from overcrowding and perforce breathing of expired air loaded with waste matter are widely known and apparently but little heeded. Communities do not stop to think of the crime they commit against helpless little children by overcrowding in cities. More than half the deaths in Chicago are under 5 years of age, a number out of all proportion to the rate in rural regions—and clearly due to overcrowding—a condition wholly unnecessary while there is so much space unoccupied.

Why force buildings high into the air to cast their shadows and gloom over surrounding areas? There is ample room to spread out upon the surface. Why shut out the life-giving and disease-destroying rays of the sun?

It may be well to lay stress upon the ubiquitous microbe and the diseases produced by it, but greater stress should be laid upon the fact that there are numberless microbes that are harmless, and very many that are useful and even necessary to mankind. Indeed, the public should be warned against microphobia (if I may use the term). The study of the microbe, its habits and tend-

encies, should be left to scientists. It is enough worry for the public to know that the dangerous microbes thrive best and multiply fastest in dirt, just plain dirt and filth and that the best and most convenient weapon to use in the conflict against them is soap and water in abundance, frequently applied and well rubbed in. Cleanliness everywhere is the best preventive against all disease-producing germs.

The public should be particularly instructed not to be in constant fear that something they eat or drink will do them harm, for suggestion of pending disease may produce it, as suggestion of help by faith in remedies may cure it. Nature is kind and is so adjusted that people in full health become immune to disease-producing germs.

Dangers of Matrimony.

The doctrine of proper selection in matrimony is one that may properly be expounded by boards of health. It is a rather striking commentary upon our civilization that the degenerate individual can, for the payment of a marriage license fee, be granted permission from the state to propagate his miserable kind. It is their kind largely that people our prisons, our insane hospitals and our almshouses, entailing an enormous public expense. It becomes a serious question when we understand that this unfortunate class of dependents appear to be yearly growing in numbers out of all proportion to the increase of population.

To address the public on sanitary matters intelligently, boards of health should not magnify themselves or their office, yet they should be qualified to speak advisedly. It naturally follows that the board should be selected because of the individual fitness of each member thereof. The selection of officers whom the public expect to stand between them and disease upon any other pretext is wholly unexcusable. This in itself furnishes a theme upon which local boards of health might first use their ability as instructors to excellent advantage.

When the public have learned this lesson thoroughly they will lend a more willing ear to the instruction offered and will see to it that none but those best qualified for the work in hand are trusted with positions of such great importance to the well-being and perpetuity of the race.

Some Facts About Bananas.

It is hardly necessary to state that well matured bananas that have not begun to decay are a very wholesome and nutritious food.

No more than that the biggest apples or pears always are the best, are the biggest bananas the finest flavored, on the contrary, the larger they are the more mealy they taste.

It is with bananas, as with other fruit, that poor soil producing small fruit, generally compensates in the quality of these for what the bunches lack in size, and yet these latter are left to rot in the plantations because they are less salable, while only the larger bunches of inferior flavor are exported.

To attain its best condition, the bunches should be cut what is called two-quarters and a half ripe, when the fruit is full of juice—that evaporates if left to be three-quarters ripe. The hardening of the rind, after cutting, if exposed to the sun and protected from wet, retains the juice. But if left to ripen on the tree the juice evaporates and the fruit has hardly any taste at all. Again there is just as much variety in bananas as there is in other fuits, and several kinds that on account of their small size are not exported, would undoubtedly find ready sale in the United States.

To the man who buys a nickel's worth of bananas it ought to be immaterial whether they come off a six hands bunch or a ten hands. Your six hands bunches containing 288 fruit, are given at the same price as one nine hands with 108 fruit, and during the nine months in the year when there is no sale for bunches below eight hands. In this point the planters loose, but the public in the United States does not gain, as the people generally hardly know what good bananas are, or the consumption would be doubled.

The cultivation of bananas, although it has in the last ten years assumed gigantic proportions, may still be said to be in its infancy. Almost every part of the plant can be used for some useful purpose; the stalk forms an excellent material for the manufacture of paper, or the fibre might be extracted; the peal of the fruit will make excellent indellible ink; the green fruit dried, can be converted into wholesome flour.

One acre of land planted in bananas, if properly cared for as it ought to be, is capable of yielding an enormous crop, and by having ten acres to attend to, an industrious man could make a good living, even if he only worked one hour a day. The fruit of a single tree sometimes weighs 70 to 80 pounds; or ten trees average 30 to 40 pounds. According to Humboldt's estimate, 10,000 square feet, which will yield only 462 pounds of potatoes, or 38 pounds of wheat, will produce 4,000 pounds of bananas, and in a shorter period of time! The fruit, however, when ripe, consists of 74 per cent. of water, of the remaining 26 parts 20 are sugar and 2

glutin of flesh forming food. Hence like rice, though exceedingly nutritious, it requires the addition of some more nitrogenous material.

Green bananas, boiled tender, if given to the hens cut up, will make them lay more eggs than any other food.

Yet, in spite of all this, the banana planters at present are hardly making a living, on account of the discrimination of the railroads against the small bunches, by charging the same rate on single small bunches as on big ones, instead of rating them by weight.

Dried bananas, or banana figs as they are called, are now in the market, and will undoubtedly soon be a great article of trade as soon as found by the schoolboy. They are sweet, wholesome and nourishing.

London Ice-Cream.—A Committee of the British Institute of Preventive Medicine, reports that by careful investigation, London ice-cream is found to be composed of only 26.5 per cent. of solids, the rest being water; that the solids consist of fats, four per cent.; sugar, twelve per cent.; starch, six per cent.; albuminoids, four per cent.; and mineral matter, one-half per cent. This all sounds well enough, and would lead the unwary reader to think that ice-cream was all right, but the denouement comes in the results of microscopical research. The microscope shows the presence, in London ice-cream at least, of bedbugs, bugs' legs, fleas, straw, hair, coal dust, woollen and linen fibre, tobacco, epithelial scales, and muscular tissue. Even the microscopical examination, however, is delectable compared with the results of bacteriological studies. These reveal in street-barrow ice-cream, a maximum number of seven million microbes per cubic centimetre, while the ice-cream of the shops has only one million per cubic centimetre. The character of the micro-organisms is extremely mixed. There are the bacteria coli commune, besides spirillæ and putrefactive microbes of various kinds. We find no account of a chemical analysis, which would perhaps add the final touch to the pathological picture of the ice-cream of the shops. In this country it is known that ice-creams chemically contain a poison known as tyrotoxicon. But in London it seems, what with the bugs and the microbes and the filth generally, there is no particular need of further research to prove that the ice-creams of the peddlers and the streets are not good things to eat. It would be a manifest injustice to the ice-cream industry, however, to suppose that the supply which is furnished to the American public is at all comparable to that which has been investigated by the English authorities.

The report is suggestive of ice-cream, probably of the same sort, from some of the commonly associated underground confectionary and bakeshops of New York and Brooklyn, as recently reported upon by the New York factory inspectors, referred to in our June number.

THE TUB FOR THE BABY.—A mother who had nearly broken her back in stooping to bathe her baby, bought, not long ago, a well-made pine table of medium size, containing a good-sized drawer. She had the legs cut down so that the table stood about twelve inches high, and white porcelain castors fastened to each leg. The table was first painted with white paint and then with white enamel, and the drawer divided into compartments. Such a table provides a convenient and safe support for a bathtub, and with a chair proportioned to its height the bath may be given while seated. All the necessaries for the bath—powder, brushes, soaps, dry sponges—may be kept in the drawer, thus saving many a step.

LETTER FROM THOMAS JEFFERSON TO DR. JENNER.

Monticello, Virginia, May 14, 1806.

SIR: I have received the copy of the evidence at large respecting the discovery of the vaccine inoculation, which you have been pleased to send me, and for which I return you my thanks. Having been among the early converts in this part of the globe to its efficacy, I took an early part in recommending it to my countrymen. I avail myself of this occasion to render you my portion of the tribute of gratitude due to you from the whole human family.

Medicine has never before produced any single improvement of such utility. Harvey's discovery of the circulation of the blood was a beautiful addition to our knowledge of the ancient economy; but on a review of the practice of medicine before and since that epoch, I do not see any great amelioration which has been derived from that discovery. You have erased from the calendar of human afflictions one of its greatest. Yours is the comfortable reflection that mankind can never forget that you have lived; future nations will know by history only that the loathsome small-pox has existed, and by you has been extirpated. Accept the most fervent wishes for your health and happiness, and assurances of the greatest respect and consideration. TH. JEFFERSON.

Brooklyn Medical Journal, June, 1896.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

ALABAMA.—*Mobile*, 31,076: J. A. Abrahams, M. D., Health Officer, reports for March: Deaths, 67—19 under five years of age. Annual death rate, 25.8.

Selma, 7622. John A. McKinnon, M. D., registrar, reports for April: Deaths, 12. Death rate, 18.9.

Relative Mortality of the Races.—A recent issue of the Mobile *Register* thus remarks upon the Louisiana State Board of Health's summary for 1895:

"It is unnecessary to give the figures of the table; they are, however, alarmingly large; and what is most noticeable about them is that the mortality among the negroes is 65 per cent. greater than among the whites, although the percentage of mortality of whites is still the largest of any Southern city save Savannah. There is some consolation, but not much, in the fact that the mortality among negroes is larger in Charleston than in Mobile. Yet another point is that the total percentage of mortality in Mobile is 80 per cent. higher than in Nashville. It will be well to bear in mind that Nashville is a thoroughly sewered city and has public ownership of waterworks. No well water in the city limits is permitted to be used for drinking purposes.

"We think the comparison will be found suggestive. In Mobile, although the whites outnumber the negroes as 17 to 14, the mortality of the respective races is as 10 to 7. For every ten white persons who die, seventeen negroes die.

Now, observe where the negroes live, what sort of water they as a class drink and what are their sanitary surroundings, and we shall not fail to find an explanation of the startling mortality among them. The conclusion is almost unavoidable that the driven wells and the water thereof, poisoned by the human excreta from the yard pits, are responsible for the numerous deaths among the negroes; and we think the excessive mortality among the whites may likewise be ascribed to the use of the poisoned water of the driven wells; only, the whites, being as a class better situated and more of them being able to avoid use of the wells, enjoy relatively a higher health rate than the blacks.

"If, therefore, we wish to escape from the ever recurring charge of being one of the unhealthiest cities of the Union, we must turn our attention first to the getting of a water supply that will enable the people to do away with the use of these wells.

* * *

"We must remember in this connection, that the people accept

bad drinking water because they cannot pay for good. The fact that the good water is not used in all parts of the city, although it is distributed very generally to all parts and is at the command of those who can pay for it, is evidence that the price is too high. No person is willing to draw water from a well if he can, at anything approximating a reasonable cost, obtain it by the turning of a fawcet. We must assume, therefore, that the good water is not used by all because all cannot afford to use it.

"In face of this fact, some of the citizens propose to make the use of the water compulsory. They display rates for water a degree lower than those now prevailing, provided that water for sanitary purposes also is taken, and declare that the fair and only thing to do will be to require the use of the wells to cease and the use of the water company's water to begin. We take issue on this point. We do not think it would be fair, and would regard it in the light of nothing less than a military necessity, not to be resorted to until every other recourse had proved a failure.

A sewerage system to be of greatest value must be put to general use. By such general use alone can we hope to reach a sanitary condition that will be satisfactory in this climate; but the operation of sewers is dependent upon a bountiful supply of water, and before we can call upon the people to make use of this water, it must be cheap.

Our platform, therefore, is this:
Cheap water;
No driven wells;
Sewers;
No cess pools;
Good health while we live;
And long life to all of us!"

CALIFORNIA.—J. H. Davidson, M. D., President, Los Angeles; J. R. Laine, M. D., Secretary, Sacramento. The Secretary reports for May: Returns from 58 cities, towns, villages, and sanitary districts, aggregating a population of 737,270, show a mortality of 986—annual death rate per 1000, 15.96.

There were 60 deaths from consumption, 81 from pneumonia, 33 from bronchitis, 8 from congestion of the lungs, 12 from diphtheria (and croup), 12 from typhoid fever, 11 from cerebro-spinal fever, 42 from cancer, 92 from heart diseases.

San Francisco, 330,000; Reports for May: Deaths, 538—128 under five years of age. From consumption, 85; acute pulmonary

diseases, 75; from zymotic diseases, 41—7 from typhoid fever. Annual death rate, 19.56.

Los Angeles, 100,000; Reports for May: Deaths, 128—25 under five years of age. From consumption, 24; acute pulmonary diseases, 14; from zymotic diseases, 11. Annual death rate, 15.36.

COLORADO.—*Denver*, 150,000: William P. Munn, M. D., Health Commissioner, reports for May: Deaths, 129. From phthisis, 28—17 contracted elsewhere. Annual death rate, 10.32.

CONNECTICUT.—Professor William H. Brewer. Ph. D., New Haven, President; Professor C. A. Lindsley, M. D., Secretary, New Haven. Report for the year ending August 31, 1895. The number of deaths was 13,873—28 only above the annual average for the five previous years, during which the population is estimated to have increased by more than 50,000. Hence, if the mortality is estimated with reference to the population, as a death rate per 1000, it was less than the average of the preceding five years.—Turning to the registration report for the calendar year 1894: Births, 20,345—birth rate per 1000 population, 24.9. Marriages, 5,830. Divorces, 367, divorced persons married again during the year, 264. Deaths, 13,699; death rate, 16.8.

The Secretary reports marked progress in the sanitary service of the State throughout, a progressive improvement in the organization of the forces concerned, and a steady advance in the application of sanitary knowledge. It is gratifying to observe that many of the local organizations throughout the State, heretofore known by name only as "boards of health," have been transformed into or supplanted by officers who pride themselves on having recognized and overcome unsanitary conditions before they have disgraced the community by killing somebody; and who, moreover, show by their cooperation in the effort of the State Board, a laudable desire to give the people the benefit of the natural advantages of the State for good drainage and pure drinking water, which, if availed of and protected as they should be, would speedily render Connecticut one of the most healthful States in the Union. Recent laws have done much and promise more in this direction, under the energetic action of the State Board and the skill of its executive officer. But unfortunately there still appear to be many clergymen who place themselves on a level with midwifes in their disregard of the social well-being of the people for the present and the future, and invite prosecution—which they should obtain—for neglecting to report marriages and births, and

still more culpable, some medical practitioners there are who fail to recognize themselves as accessories to murder in cases of death from infectious diseases which they have neglected to communicate to the sanitary officers in due time. And these should be indicted.

There are several subreports in detail on local epidemics and investigations. Notably the propagation of typhoid fever by oysters poisoned with sewage; the epidemic in Stamford by milk polluted with foul well-water; at Danbury and several other places by sewage-polluted water; and on the sources and spread of diphtheria and other infectious diseases and the means used for their suppression, in numerous places, exhibiting throughout constant vigilance and energetic effort.

The Secretary's bulletin for May comprises reports from 166 towns in the State, with an aggregate population of 812,390, from which the number of deaths reported for the month was 1,203. The death rate for the larger towns is 18.9; for the smaller, 19.6, and for the whole State, 17.7. Deaths from zymotic diseases, 159—13.2 per cent. of the total mortality—chiefly from measles 49—19 in Waterbury and 9 in Hartford; and diphtheria, 37—11 of which were in New Haven, in other places from 1 to 6 of these diseases.

DELAWARE.—E. W. Cooper, M.D., President, Camden; E. B. Frazer, Secretary, Wilmington.

DISTRICT OF COLUMBIA, white, 187,600; colored, 87,900: 275,500. W. C. Woodward, M. D., Health Officer. Reports for the two weeks ending May 23, 23; Deaths, 83—23 under 5 years of age. From consumption, 13. Death rates: White, 14.1; colored, 18.9: 15.7.

"A fall of over 16% in the mortality as compared with the week before. The improvement was mainly in a decrease in the diseases of the respiratory organs and of the mortality among children under 5 years of age—23 as against 35 in the week before.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M. D., State Health Officer, Jacksonville. May 16, (Jacksonville Times): The Secretary reports the health of the State at present good—no disease of a dangerous epidemic nature existing anywhere. He says that quarantine stations have been established at Fernandina, Punta Rassa and Mullet Key, near Tampa, and all are in good working order. There are also reliable inspectors of vessels stationed at Mayport, near Jacksonville, St. Augustine, West Palm Beach, Miami, Apalachicola, Pensacola,

Key West, Charlotte Harbor and at several other points. There is now but one port in the State that is not under the supervision of the State Board of Health—Pensacola.

Dr. Porter says he has the best protection this season along the coast he has ever had, and feels that the State is save from invasion by plague from foreign lands. Quarantine on vessels from Havana is very strict, and since the 1st of May the travel has fallen off considerably. Dr. Burgess, the agent of the State Board in Havana, will not issue permits to anyone to board a vessel bound to this State unless the person has previously had yellow fever, or has been a resident of Cuba for ten years. The captains of the Plant and Morgan line steamers will not allow anyone on their vessels unless they are provided with a certificate from Dr. Burgess.

Pensacola, 15,000: Report for May: Deaths, 29—14 under five years of age. Death rate, 23.2. One case of smallpox remained June 6.

ILLINOIS.—William E. Quine, M. D., President, Chicago; J. W. Scott, Secretary, Springfield.

Chicago, 1,600,000: William R. Kerr, Commissioner, reports for May: Deaths, 1804—713 under five years of age. Death rate for the month, 1.13; for the year ending May 31, 14.77. Prevailing causes of death and the numbers: From diphtheria, 49; typhoid fever, 31; consumption, 231; pneumonia, 168; bronchitis, 124; whooping cough, 22.

"*Cost of Impure Water.*—If a human life is worth $5,000, as the Legislature of the State of Illinois has decreed, then it is an easy matter to demonstrate beyond any peradventure that the City of Chicago is losing at the rate of more than $3,000,000 a year through a polluted water supply."

INDIANA.—Douglass C. Ramsey, M. D., President, Mount Vernon; J. N. Hurty, M. D., Secretary, Indianapolis.

Indianapolis Journal, June 2.—The polluted water from the Strawboard company's works at Nobleville is beginning to have its effects on the city. In the districts where the workingmen reside sickness has broken out. Thus far the symptoms are nausea and slight fevers, with no serious results. What may be the outcome after the disease germs have had time to develop, no physician will offer to foretell.

The water in the city wells was analyzed to-day by City Sanitarian Ferguson and Dr. J. N. Hurty, Secretary of the State Board of Health, with alarming results.

It contained 4 per cent. more of poisonous nitrites than the slime taken from the river.

Indianapolis people are thoroughly aroused, and there is talk of a public indignation meeting. Citizens are denouncing the criminal outrage both on the part of the Strawboard works for emptying their twenty-four acres of slop into the river and on the part of the Indianapolis Water company for taking its supply direct from the river after every one in town knew of the great damage.

At the Council meeting to-night a resolution was introduced instructing the City Attorney to begin suit at once against the Indianapolis Water company for criminal carelessness.

The company itself began suit to-day against the American Strawboard works. This is the great American Strawboard trust, with headquarters in Chicago, which was permanently enjoined two years ago in the Federal Court for running its refuse into the river.

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

At the annual meeting of the Board, May 12th: *Diphtheria* was reported during the present quarter in Adair, Appanoose, Benton, Boone, Buena Vista, Calhoun, Cerro Gordo, Clay, Crawford, Davis, Guthrie, Greene, Hamilton, Jones, Iowa, Lee, Linn, Madison, Marshall, Mills, Polk, Palo Alto, Poweshiek, Plymouth, Ringgold, Sac, Shelby, Story, Winneshiek, Woodbury, Warren and Worth counties.

Scarlet Fever was prevalent in Mills county; and cases were also ported from the counties of Adams, Benton, Buchanan, Butler, Cass, Cherokee, Clay, Calhoun, Fayette, Fremont, Grundy, Guthrie, Hardin, Keokuk, Linn, O'Brien, Ringgold, Sioux, Van Buren, Wapello and Woodbury.

Measles was reported from the counties Davis, Calhoun, Jones, Marshall, Mills, Scott and Warren. At Rhodes, in Marshall county, it is said to have affected the whole town. Respecting the quarantine of this disease the Secretary said: "There is yet little effort made to restrict the spread of this disease, though scores die annually from its ravages. I do not think I made a misstatement when I assert that more persons die annually in Iowa from measles than have died from small-pox since the organization of the State Board of Health—sixteen years ago."

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. F. Patton, M. D., Secretary, New Orleans.

Biennial Report 1894-1895, is especially felicitous on the continued success of the quarantine restrictions against the introduction of yellow fever, and the incalculable benefit of this exemption to New Orleans and the whole State of Louisiana— indeed to the whole Mississippi valley, which virtually depends upon the efficiency of the Louisiana State quarantine system. The regulations during the two years reported upon have been in line with those described in previous reports, but with increased facilities with regard to vessels arriving in the night-time, providing the sanitary conditions of the ports of departure are reported to be satisfactory by the State Board's own inspectors at such ports. The policy of the Board in maintaining inspectors in foreign ports has been found to be absolutely necessary in the interest of the public health and the fruit trade.

Of *Smallpox*, in 1894, there were in New Orleans but eight cases, the last case of the year being in May. It was again introduced in February, 1895, by a person just arriving from Hot Springs, Ark., where the disease was epidemic. Since which time this city has not been exempt. But, with the cooperation of the United States Marine Hospital Service, the disease has been successfully restricted, prompt isolation and energetic vaccination of the unprotected, insomuch that according to the most recent reports—since the issue of the Biennial Report—it is under control. It has been almost wholly confined to the colored —unvaccinated population.

Garbage Disposal is in New Orleans as in most other American cities—New York and Brooklyn included—an unsolved, or rather an experimental problem; and is likely to so continue so long as the sanitary authorities allow themselves to be imposed upon by the nuisance-rendering processes, instead of the more effectual, shorter and more economical—to the public health—*destructive* processes. Thus far, none of the garbage-rendering processes that would make money out of the residue without nuisance to the neighborhood, has been successful. It is high time that the sanitary authorities regarded the health and comfort of the people of more importance than the commercial value of the garbage.

Of the rest, the volume is, for the most part, a detail of the reports that have been in these pages monthly, during the period.

New Orleans, 295,000—80,000 colored: Deaths in May, 752—colored 276; 327 under five years of age—88 colored. Death from consumption, 70; pneumonia, 35; bronchitis, 9.—*Smallpox*, 25,

all colored; cholera infantum, 96; enteritis, 56. Death rates: Whites, 29.29; colored, 41.40: 32.81.

At a meeting of the Board, June 11, Chief Sanitary Inspector Woods reported that smallpox was well-nigh a thing of the past, and no cases of scarlatina. During the month of May, the sanitary force made 779 vaccinations. Several cases of fever among the employees of the American Sugar refinery were traced to the drinking water which came from the river, unfiltered, and which was drawn from a source a few feet distant from the sewer pipe of the charity hospital.—An active crusade is kept up against impure milk, 167 samples were examined during the month, of which 47 were found to be watered. Dairy sanitation was discussed, and legislative authority and appropriation of funds urged for its prosecution.

MARYLAND.—John Morris, M. D., President, Baltimore; James A. Steuart, M. D., Secretary, Baltimore.

Baltimore, 496,315—73,747 colored. James F. McShane, M. D., Health Commissioner, reports for the year 1895: Deaths, 10,301; 7,884 white persons, and 2,417 colored, an increase of 815 over the preceding year. Death rates: Whites, 18.63; colored, 32.06: 20.76, 39.03 per cent. of the total mortality was of children under five years of age. Deaths from consumption, 1,141—11.07 per cent. of the total mortality. From pneumonia, 933; cholera infantum, 510; diphtheria, 265; typhoid fever, 173.—*Sewerage* continues to be Baltimore's disgraceful need.

"It is not asserting too much to declare that our privies are the most dangerous enemies of our lives and happiness. The contents of these abominable receptacles have free access to the soil, and saturate the ground with liquid filth to such a degree that specimens of sub-soil water taken from different depths and in different sections yield a large percentage of organic matters the products of animal execration. Many of them overflow, and the liquid contents flow into yards and gutters, emitting most offensive odors, which are a fruitful source of disease, operating indirectly in its production and directly in lowering the vital stamina of the unfortunates compelled to breathe a polluted atmosphere." PUBLIC BATHS are also urged by the Commissioner as an important factor in the comfort, health, and well-being of the people. —For the month of May: Deaths, 658—499 were whites and 159 colored. Deaths from infectious diseases, 39; 91 from consumption; 50 from pneumonia; 17 from bronchitis, and 11 form typhoid fever. 220,

or 33.34 per cent. of the total, were of children under five years of age. Cases of infectious diseases reported during the month, 46.

MASSACHUSETTS.—H. P. Walcott, M. D., Chairman, Cambridge; S. W. Abbott, M. D., Secretary, Boston.

Boston, 501,083: S. H. Durgin, M. D., Chairman. Deaths in April, 1,019—270 under five years of age. Annual death rate, 24.40 per 1000. From diphtheria (and croup), 47; scarlatina, 11; consumption, 120. Cases of contagious diseases reported for the month: Diphtheria, 304; measles, 344; scarlatina, 108; typhoid fever, 30.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

The Secretary reports for May: Compared with the preceding month, remittent fever and erysipelas increased, and pneumonia, influenza, and pleuritis decreased in area of prevalence. Compared with the average for May in the ten years, 1886-1895, pneumonia, scarlet fever, erysipelas, consumption, remittent fever, diarrhea, influenza, inflammation of kidney and whooping cough were less than usually prevalent. No disease was more than usually prevalent.

Including reports by regular observers and others, *consumption* was reported present in Michigan in the month of May, 1896, at 206 places; *measles* at 65 places; *scarlet fever* at 52 places; *diphtheria* at 40 places; *typhoid fever* at 34 places; *whooping cough* at 27 places and *small-pox* at one place.

Reports from all places show *consumption* reported at 41 places less; *measles* at 5 places less; *scarlet fever* at 16 places less, *diphtheria* at 9 places less; *typhoid fever* at 10 places less, *whooping cough* at 1 place more, and *small-pox* at 4 places less in the month of May, 1896, than in the preceding month.

MINNESOTA.—Franklin Staples, M. D., President, Winona; C. N. Hewitt, M. D., Secretary, Red Wing.

Minneapolis, 225,602: H. N. Avery, M. D., Health Commissioner, reports for April: Deaths, 141—43 under five years of age. Deaths from diphtheria, 5; typhoid fever, 4; consumption, 19. Death rate, 10.40.

St. Paul, 140,292: Alexander J. Stone, M. D., Commissioner, reports for May: Deaths, 94—30 under five years of age. Annual death rate per 1000 was 8.04. Deaths from diphtheria (and croup), 3; typhoid fever, 1; consumption, 9.

MISSISSIPPI.—*Smallpox* at Vicksburg. City Physician reports (Picayune), May 28th: "We now have 19 cases convalescing in the pesthouse, outside of the city, safely quarantined and guarded; two cases in the city, also under strict quarantine; and fifty-six persons in quarantine and strictly guarded, also outside of the city, who have been exposed to the disease within the past several weeks, but who have not contracted it, and being vaccinated, are not likely to do so. There have been no new cases in ten days. It is true, we are vaccinating hundreds of people daily, and will continue to do so until every soul in the city is thoroughly vaccinated and protected."

MISSOURI.—F. J. Lutz, M. D., President, St. Louis; Willis P. King, M. D., Secretary, St. Louis.

St. Louis, 570,000—31,000 colored: M. C. Starkloff, M. D., Commissioner of Health, reports for May: Deaths, 779—237 under five years of age. From diphtheria (and croup), 18; phthisis, 77; typhoid fever, 9; pneumonia, 45; bronchitis, 21. Annual death rate per 1000, 16.4.

Kansas City, 150,000: R. P. Waring, M. D., Health Officer, reports for May: Deaths, 127—44 under five years of age. Death rate, 10.16. From consumption, 11; pneumonia, 8.

NEBRASKA.—J. V. Beghtol, M. D., President, Friend; F. D. Haldeman, M. D., Secretary, Ord.

Omaha, 140,000: S. R. Towne, M. D., Commissioner of Health. J. J. Saville, M. D., Commissioner of Health in 1895, reports for that year: Births (exclusive of 83 still births), 1,900; deaths, 1,122—451 under five years of age. Deaths from consumption, 108; capillary bronchitis, 58; pneumonia, 54; heart diseases, 55. From zymotic diseases, 257, chiefly: cholera infantum, 78; diphtheria (and croup), 44; scarlet fever, 43; typhoid fever, 29; whooping cough, 26—form the rest 1 to 8. Of diphtheria there were 114 cases, the mortality 36 per cent. This disease was less prevalent than at any time during the previous ten years, even when the population was but half as great. In 1890-1891, there were four times as many cases and deaths. The improvement is attributed to careful oversight of the schools and more effectual disinfection of premises. Of typhoid fever there were but 112 cases reported with a fatality of 25.9 per cent. Seventeen were imported; 20 used well water in the city; 10 were secondary cases; 6 were possibly due to an infected well in a dairy. Of the remaining 54, several were due to evident unsanitary surroundings. Commissioner Towne re-

ports for April, 1896: Deaths, 67—27 under five years of age. Annual death rate, 5.7. Communicable diseases reported: diphtheria, 7; scarlet fever, 11; whooping cough, 1.

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

Hudson County—Jersey City and vicinity, 338,671: Report for May: Deaths, 474—183 under five years of age; from diphtheria (and croup), 29; typhoid fever, 6; total from zymotic diseases, 68; from consumption, 54; pneumonia, 81. Annual death rate, 20.1.

Newark, 215,725: Health Officer Lehlbach reports for the week ending June 13th: Deaths, 65—21 under five years of age; from diphtheria, 6; consumption, 4; pneumonia, 3. Annual death rate, 15.64.

Paterson, 101,808: J. I. Leal, M. D., Health Officer, reports for May: Deaths, 141—36 under five years of age; from diphtheria (and croup), 7; consumption, 15; pneumonia, 12.

The Passaic Sewer.—The Passaic River Commission held a meeting at Belleville, June 3d, at which a number of prominent citizens and owners of real estate were present, and gave testimony as to the condition of the polluted stream and its effects upon the public health and real estate values. Twenty years ago the Passaic was a clear stream, well stocked with fish, and the fishing industry was a considerable one during the shad season. It was shown that now, owing to the masses of sewage, deposited by Paterson, Passaic, East Orange, Bloomfield, Montclair and Newark, the stream is dirty and foul-smelling. Along its shores stand numbers of mansions deserted by the owners and falling into decay. Residents upon the banks are obliged to keep their windows closed, even on the hottest nights in summer. Property values have become depreciated, and it is impossible to rent a desirable house. The mass of sewage, instead of being carried out to sea, is banked up by the tides and floated back and forth until it is at length deposited on the flat lands along the shores. The stench has been noticed on the high lands a mile away, and the least commotion of the water releases gases which are noticeable twenty feet above the surface. Local physicians say that it is a continual source of illness, and that, while no epidemic has resulted, it is a constant menace to public health.

NEW YORK.—Daniel Lewis, M. D., President, New York; B. T. Smelzer, M. D., Secretary, Albany.

Bulletin reports. The State is divided into Sanitary Districts,

as follows: *Maritime District:* Includes New York, Brooklyn, Long Island, Staten Island and Westchester county. *Hudson Valley District:* All the counties on either side of the Hudson river, except Westchester, to and including Albany and Rensselaer. *Adirondack and Northern District:* The northern section of the State—the counties of Washington, Warren, Hamilton, Essex, Clinton, Franklin, St. Lawrence, Jefferson and Lewis. *Mohawk Valley District:* Schenectady, Schoharie, Saratoga, Montgomery, Fulton, Herkimer and Oneida counties. *Southern Tier District:* The seven counties along the southern boarder of the State. *East Central District:* Sullivan, Delaware, Otsego, Madison, Chenango, Onondaga and Cortland counties. *West Central District:* Cayuga, Tompkins, Seneca, Schuyler, Ontario, Yates, Livingston, Genesee and Wyoming counties. *Lake Ontario and Western District:* Oswego, Wayne, Monroe, Orleans, Niagara and Erie counties.

The Secretary's Bulletin reports for April: Deaths, 10,480—a daily average of 350 against 358 in March, and a death rate of 19.30 against 20.00, that of the two preceding months. Of the *Zymotic* diseases *Measles* caused 100 more deaths than a year ago, but from the other diseases of this class the mortality was materially less. *Diphtheria* caused 350 deaths, which is 75 fewer than occurred in April last, and is the smallest mortality for this month in the past ten years; it is also the least number of deaths from this cause since last September. *Whooping Cough* and *Diarrheal* diseases show a slight increase over March. There were 2,120 deaths from *acute Respiratory diseases*, which is estimated to be 300 above the normal for the month, and from *Consumption* there is a moderate increase, although the mortality reported from it is 300 less than in March. It is estimated that the *Grippe* epidemic, which prevailed mildly in January and February, and increased in March so as to cause 1,100 deaths, has during April so far diminished as to have exaggerated the mortality of the month by 400 deaths making the total mortality of the present epidemic 2,500. The only sanitary districts which failed to show a decrease in their death-rate as compared with last month are the Lake Ontario and Western, and the Adirondack and Northern. *Measles* caused few deaths outside the Maritime, Hudson and Mohawk Valley districts. Three-fourths of the deaths from scarlet fever were in the Maritime district. Only 10 deaths from this cause and 20 from *Diphtheria* occurred in the rural parts of the State, or about 7 per cent. of deaths from them, while 30 per cent. of the deaths from *Typhoid Fever* occurred there. The prevailing wind

was south-west, the mean barometer for the month 30.11 and the rain fall 1.50 less than the average. The mean temperature was 45.50 which is 1° above the normal, the highest range being 84°.

New York City, 1,995,000: Deaths, 3,912—1,578 under five years. Death rate, 23,85. Zymotic diseases per 1000 from all causes, 135; diphtheria (and croup), 146; typhoid fever, 12; consumption, 468; acute respiratory diseases, 980.

Brooklyn, 1,100,000: Deaths, 1,854—658 under five years. Death rate, 20.40. From zymotic diseases per 1000 from all causes, 125.70; diphtheria (and croup), 99; typhoid fever, 3;consumption, 209; acute respiratory diseases, 374.

Buffalo, 335,709: Deaths, 363—120 under five years. Death rate, 13.0. From zymotic diseases per 1000 deaths, from all causes, 170.50: diphtheria (and croup), 13; acute respiratory diseases, 69; consumption, 39.

Rochester, 160,000: Deaths, 183—40 under five years. Death rate, 13.75. From zymotic diseases, per 1000 deaths, from all causes, 55; consumption, 27; acute respiratory diseases, 25.

Albany, 100,000: Deaths, 179—37 under five years. Death rate, 21.48. From zymotic diseases, per 1000 deaths, from all causes, 83.35; typhoid fever, 4.

Syracuse, 100,000: Deaths, 120—22 under five years. Death rate, 14.40. From zymotic diseases per 1000 deaths from all causes, 66.70; consumption, 40; acute lung diseases, 8.

Elmira, June 9th. The Board of Health adopted resolutions ordering the Water Works company to begin the construction of a proper filtering plant or apparatus for the purification of the water before the 13th day of July, 1896. In event of failure to comply with the company, the Board promises a penalty of $100 a day.

NORTH CAROLINA.—George G. Thomas, M. D., President, Salem; Richard H. Lewis, M. D., Secretary, Raleigh.

May Bulletin summarizes the report of 82 counties for April. The principal diseases, named in the order of their greater prevalence, were measles, whooping cough, malarial fever and typhoid fever. The mortuary statistics for the month, of an aggregate population of 27 towns, 86,422 white and 61,663 colored: Deaths, respectively, 90 and 119, and death rates 12.5 and 23.2. The chief causes of death were: consumption, 24; pneumonia, 37; measles, 12; brain diseases, 16; heart disease, 15; diarrheal diseases, 12; from other diseases, 1 to 5. Deaths under five years of age, white, 22; colored, 32.54.

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus.

Cincinnati, 350,000: J. W. Prendergast, M. D., Health Officer, reports for May: Deaths, 465—144 under five years of age. Death rate, 15.97 per 1000. From diphtheria (and croup), 3; typhoid fever, 11; consumption, 66; pneumonia, 47; measles, 8.

Cleveland, 330,279: J. L. Hess, M. D., Health Officer, reports for April: Deaths, 349—30 under five years; from diphtheria (and croup), 10; typhoid fever, 14; consumption, 16; pneumonia, 36. Death rate, 12.44.

Toledo, 122,760: J. T. Woods, M. D., Health Officer, reports for May: Deaths, 109—15 under five years. Annual death rate, 10.65.

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

Philadelphia, 1,188,793: Theodore B. Stulb, Health Officer, reports for five weeks ending May 30th: 2,342—648 under five years of age. Deaths from diphtheria (and croup), 88; typhoid fever, 52; consumption, 264; pneumonia, 217.

The Schuylkill Sewer continues to be a subject of deep concern to the Board of Health and everybody in the city of any sanitary knowledge, and the City Council's Committee on Water has at last (June 4th) authorized the Mayor to make a contract with the Philadelphia Water and Filter Co. "for the enlargement and purification by filtration of the water supply of Philadelphia." But as the ordinance carries with it an appropriation, further time is required to carry it into effect. Meanwhile the results from the continued use of the foul stream for the supply of drinking water are more and more manifest by the increasing prevalence of typhoid fever.

Pittsburg, 275,000: Report for five weeks ending May 30th. Deaths, 407—163 under five years of age; typhoid fever, 14; consumption, 44. Death rate, 15.0.

SOUTH CAROLINA.—J. R. Bratton, M. D., Chairman, Yorkville; H. D. Fraser, M. D., Secretary, Charleston.

Charleston, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M. D., Health Officer, reports for four weeks ending May 30th: Deaths 146—91 colored. Under five years of age, 64. Annual death rates, white, 20.17; colored, 36.07; 29.12.

TENNESSEE.—J. D. Plunkett, M. D., President, Nashville; J. Berrien Lindsley, M. D., Secretary, Nashville.

The Secretary's Bulletin reports: The principal diseases named in the order of their greater prevalence, in the State for the month of April were: Measles, lung diseases, acute consumption, malarial fever, typhoid fever, la grippe, scarlet fever, whooping cough, mumps, chicken-pox and small-pox.

Small-pox reported in the State during the month: In the city of *Memphis* (Shelby County), 6 cases, all colored; in Shelby County outside the city of Memphis), 11 cases—2 white and 9 colored, with 3 deaths. Two cases were reported from Covington, Tipton County; also one other case reported from Cedar Point, making a total of 3 cases in Tipton County, all colored. In Jackson, Madison County, one case was discovered in the person of a negro man, porter on a passenger train running between Jackson, Tenn., and Cairo, Ill., thus making a total of 21 cases (2 white and 19 colored), with 3 deaths, in the State for the month. Vaccination, isolation and disinfection were promptly and rigidly observed. The disease is abating in Tennessee.

Nashville.—Report for the year 1895: Population, 87,754—32,159 colored. Deaths reported for the year, 1,816—974 colored. Death rates: white, 15.42; colored, 29.37: 20.69.

Attention is called to the fact that there was an increase in deaths over the preceding year, 1894, of 295; of this increase the whites furnished 106 and the colored 189. The deaths under five years of age were 512, white, 195; colored, 317, as compared with the preceding year, during which 507 deaths under five years of age were reported, white, 222; colored, 285, a decrease in the whites and an increase in the colored.

Memphis, 55,923—white, 28,064, colored 27,859. J. J. McGowan, M. D., Secretary of the Board of Health, reports for the month of May: Deaths, 115—61 colored. Death rates, white, 16.03; colored, 17.15: 16.81. Contagious diseases reported during the month: Smallpox, 10; diphtheria, 6.

UTAH.—*Salt Lake City*, 48,076: W. T. Dalby, M. D., Health Commissioner, reports for the year 1895: Deaths, 554; death rate, 7.91. As an illustration of the effects of practical sanitation during recent years the following summary is presented:

Deaths reported in 1891, 1,163—death rate, 23.26; in 1892: 717—11.93; 1893: 726—10.37; 1894, 567—8.09; 1895: 554—7.91. By which it appears that the death rate for the year 1895 is but one-third of that for the year 1891, and as the Health Department was created in the year 1891, these statistics show a most grati-

fying result of the labors of the Department. There is no condition that speaks better for a city, no advertisement that results so beneficially as its report of a low death rate. The force of the statement is still further manifest by the decrease in zymotic diseases—cases commonly understood to be preventable by timely sanitary measures. Thus, in the year 1891, there were 388 deaths reported as occurring from this class of affections, being 33.26 per cent. of the total mortality; or, in other words, one-third of the deaths occurring in 1891 from zymotic diseases. During the year just ending we find but 93 deaths reported from these causes, being but 16.78 per cent. of the total mortality. Two deaths only from zymotic diseases—one each from typhoid fever and whooping cough; two from consumption; five from pneumonia.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; W. O. B. Wingate, M. D., Secretary, Milwaukee.

Milwaukee, 255,000: Walter Kempner, M. D., Commissioner of Health, reports for May: Deaths, 288—186 under five years of age. Annual death rate, 15.6. Deaths from diphtheria (and croup), 11; consumption, 32. Cases of diphtheria reported during the month, 40; scarlet fever, 7; typhoid fever, 2; measles, 4.

SANITATION IN CALCUTTA, according to a recent Indian daily paper, is in a very bad way. Among the items of the indictment we are told that the defective condition of the sewers has reduced the subsoil to a condition little different from a trenching ground; that the scavenging of the streets is a public scandal; that refuse, which ought to be removed before dawn, is frequently left lying about, fermenting and poisoning the air throughout the heat of the day; that the water supply is defective, and that the death rate is abnormal during the hot weather. The cause to which this disquieting state of affairs is ascribed is an old and familiar one—namely, the preponderance of native members on the municipality. The remedy propounded is drastic. "The feeling is growing stronger that sanitation of Calcutta cannot be left indefinitely to be the plaything of gentlemen like Babus Norindro, Nath Sen and Surendranath Banerjee, and whether the reform be made from within by the expedient of nominating more Europeans, or from the outside by the more drastic measure of abolishing an elected municipality altogether and substituting some other administrative authority, a change must not be much longer delayed." Evidently some people would like to make things lively for Babus Norindro, Nath Sen and Surendranath Banerjee.

NEW BOOKS AND BOOK REVIEWS.

How to Feed Children: A Manual for Mothers, Nurses and Physicians. By Louise E. Hogan, 12 mo. pp. 236; Illustrated. Price $1.00.—Philadelphia: J. B. Lippincott Co.

A condensed abstract of a great amount of useful literature on the subject by the best authorities, so entirely divested of all technicalities as to render it easily intelligible to non-professional readers; and so well authenticated as to render it a safe reference manual for the busy physician. While without pretence to a complete dietary for children, it contains everything that is most useful and nothing that is objectionable, insomuch that to mother and nurse alike, it is a safe guide in both the choice of foods and the manner of preparing them, and with variations alike suitable for children in health and in sickness.

A Study of Hypnotism. By Sydney Flower, Author of "Hypnotism Up to Date." 12 mo. pp. 226. Chicago: The Psychic Publishing Co.

An interesting narrative of an always interesting subject; involving, as it does, the romance of dreams suggested by wakeful thoughts. However questionable the utility of hypnotism or the practice of the professioanl hypnotiser may be, there can be no question to any one at all versed in psychology, but that the different qualities of the human mind, in one state or another, in different individuals, render the weaker more or less subject to the sway of the stronger, involuntarily. How this is effected it is the purpose of this book to show. The existence and transference of magnetic fluid is referred to, as means of accounting for hypnotism by induction, but since as little is known of the nature of that kind of fluid as of a supposable hypnotic fluid, the author, apparently for this reason, says but little about it. All that he shows and all that he appears to be able to show is, that by physical manipulation only some persons are able to induce some other persons to sleep—and sleep thus induced is called hypnotic sleep. That sleep is a good thing and nature's great restorer everybody knows. And that there should be some persons who, having discovered their hypnotic power, have been quick to endeavor to turn that power to personal advantage—as persons inclined to quackery in all ages have ever been ready to do—is not particularly remarkable, except to point a moral: all quacks are dangerous.

To know what hypnotism is, devoid of quackery, it affords us

pleasure to commend this entertaining description of a subject of which all intelligent persons should have knowledge.

THE MEDICAL DIRECTORY OF THE CITY OF NEW YORK, 1896. —Published under the Auspices of the Medical Society of the County of New York. 12 mo. pp. 278. Price $1.00. Chas. H. Avery, M.D., Secretary, 238 E. 18th street.

An annual manual, of which the physicians of New York and vicinity, can hardly afford to do without. For, besides the physicians of the States of New York, New Jersey and Connecticut, and their addresses, it comprehends the names and locations of all the Benevolent Societies, Asylums, Homes, Hospitals, Colleges, Academies, Seminaries, Dispensaries, Infirmaries, Institutions, and officers thereof—in short, pretty much everything of interest to physicians and their belongings, and how to find them.

TRANSACTIONS OF THE AMERICAN DERMATOLOGICAL ASSOCIATION, 1895, Charles Allen, M.D., Secretary, 126 E. 60th street, New York.

A pamphlet of two hundred pages, containing papers and discussions on Angiokeratoma of the Scrotum, Raynaud's disease of the Ears, Lupus Erythematosus, Hydroa Aestivale, Bromide Eruption and a dozen other subjects of interest to medical practitioners generally and to Dermatologists in particular.

CONTEMPORARY LITERATURE.

THE RACE QUESTION IN SOUTH AFRICA.

Hitherto the most interesting features in the history of South Africa have been the relations to one another of the races that originally inhabited or have recently occupied it, and the most difficult problems which its future presents arise from the relations of these races. Three races are native, four are European. The cases of contact or conflict between European and aboriginal races, which have been numerous during the last four centuries, inclose those where the native race, though perhaps numerous, is comparatively weak, and unable to assimilate European civilization, or to thrive under European rule (a rule which has often been harsh), or even to survive in the presence of a European population occupying its country; those where Europeans have conquered a country already filled by a more or less civilized population, which is so numerous and so prolific as to maintain itself in their presence; and those in which the native race is numerous

and strong enough to maintain itself in the face of Europeans, while, on the other hand, there is plenty of room left for a large European population to press in. This is what has happened in South Africa; the Dutch and the English settlers do not mix their blood with that of the natives. So far as can be predicted, both white and natives will go on increasing, but not blending. We shall presently see how grave are the problems to which this fact must in the future give rise.—"Impressions of South Africa," by James Brice, in the June *Century*.

America Not Yet Ready to Exclude Immigrants.—It would be an easy thing, of course, to exclude all migration from Italy by the enactment of restrictive measures which would be substantially prohibitory; but the quality of such statesmanship may well be seriously doubted. Despots indulge in radical measures without regard to consequences and with no other consideration than their own personal pleasure and comfort. Patriotic statesmen, on the other hand, must not hesitate to face every problem, to study it carefully and to try to find the best possible solution. The United States of America are, in my sincere conviction, not yet ripe, and will not be for a long period of years, to exclude any immigrants who are not really undesirable. The Immigration Investigation Commission very properly said in their report that an entire closing of our ports to immigrants would inevitably result in untold injury to, if not in the very annihilation of, our largest transportation and manufacturing enterprises, in a disastrous stoppage in the development of great sections of the country, and in a famine of servants and menial laborers. Italians as a nationality, certainly do not belong *per se* to an undesirable class of immigrants. There are vast regions in the South and West, and on the Pacific coast, for the colonization of which they are unquestionably and pre-eminently adapted, and as manual laborers for many varieties of work which Anglo-Saxons are very loth to undertake they are beyond a doubt excellently fitted.

If they are hired out in large masses by unscrupulous padrones, let the padrone system be fought and suppressed. If they are uneducated, let our public schools take care of them. If some are afraid of their voting power, on account of their ignorance—an assumption, by the way, which is rather curious in a country with millions of negro voters—let the United States restrict their naturalization. If we do not want to receive absolute illiterates, let us exclude them by a reasonable test, but without separating families, parts of which may be already here. Let us in general exclude

all undesirables, whether they are of Italian or any other nationality, but let us beware, most of all, of dangerous and thoughtless generalities which are based only on the ignorance of facts.—From "Immigration from Italy," by Dr. J. H. Senner, U. S. Commissioner of Immigration, in *North American Review* for June.

ST. LOUIS, A TYPICAL AMERICAN CITY.—St. Louis, in more than one sense, must be accorded a central place in the series of great American towns. It is not only central by virtue of its geographical situation, but it is also more typically American than any other of our large communities, by reason of the blending of the several American types of population. The process of assimilation has been more complete than in the Northwestern towns, and distinctions of race and class are less sharp than in most Eastern cities. St. Louis is comparatively an old community. It has succeeded fairly well in reducing New Englanders, Virginians, New Yorkers, men from the Gulf States, Kentuckians, Northwesterners, Missourians, the Illinois contingent, the Texans and the Irish and Germans as well, into a body of progressive yet conservative Americans, to which each element has contributed something, while losing the sharp edges of its own eccentricities. There results a community that is typically American and more completely representative of our whole country, such as it is, than any other one of the dozen largest American cities. It also happens that St. Louis is the most satisfactory exponent of what may be called the distinctively American system of city government that the country affords on any similar scale of magnitude.—"Notes on City Government in St. Louis," by Albert Shaw, in the June *Century*.

AMERICAN LIFE ILLUSTRATED.—The newness of American life was illustrated the other day (May 27) at Minneapolis, when 7,000 school-children, in relays of a thousand, hauled the first house ever built in Minneapolis through the streets of the town to the site that had been arranged for it in Minnehaha Park. The house was built forty-seven years ago, and not only has it survived, but its builder is living too, as well as his wife, who came from New York to live in it. He is Colonel John H. Stevens, a veteran of the Mexican war, who was born in 1820, went to Minnesota in 1849 for the good of his lungs, and not finding a claim that suited him in the village of St. Paul, went up the river and staked out a farm at St. Anthonys Falls, on land that is now the centre of a city which brags of its 200,000 inhabitants, and hopes to have a million more. Colonel Stevens has been a leading man in Minneapolis ever since

he started the town, and apparently has not failed to gain such legitimate advantages as ought to accrue to a pioneer who selects his farm with discretion and abides by his choice.—*Harper's Weekly.*

THE FOOD OF THE POOR.—The studies of the foods of people of the poorer classes, especially in the large cities, are full of interest. We have been wont to say "the destruction of the poor is their poverty," but here it is rather their improvidence. They suffer less from lack of money than from lack of economy in its use. Often this bad economy is due to pride and unwillingness to economize, and often it is due only to ignorance.

A large number of the investigations just referred to were made by a lady physician, who has practiced for a number of years among the poorest people in New York. She lately remarked: "I think I know personally at least four hundred families in the worst congested region of this city. I have practiced by profession among them, am familiar with their ways, their family histories, and many of their family tragedies. I have seen a great deal of the mission work done among them by religious organizations, and can bear most emphatic testimony to its usefulness. But if I were to say where the philanthropist must begin, if he will improve their physical and hence their intellectual and their moral condition, it would be at the table. There is no one respect in which there is so great need of reform among them—no one way in which so much good can be done—as in the improvement of their food and their nutrition."—From "The People's Food—A Great National Inquiry," in June *Review of Reviews.*

WHITE CORPUSCLES.—In addition to the red blood corpuscles we find in the blood very small colorless ones, called "blood platelets." Of these we need take no further notice here; but, existing in the proportion of about two or three to every thousand red ones we find the white corpuscles of the blood. These corpuscles are colorless, and stand out in contrast to their red neighbors, which are colored with a substance called *haemoglobin*, whereof iron is a prominent constituent. But more important is to note that in its constitution each white corpuscle is a very different body from its red neighbor. It is really a microscopic mass of living protoplasm. It has a nucleus in its interior, and in every respect we may regard it as a living cell. Moreover, it behaves itself as an independent cell, just as the researches of early days informed us. Watched on a specially prepared microscopic slide, we see the

white corpuscle flow from one shape to another. In this respect it moves by alterations of its protoplasmic substance, just as does the animalcule we know as the *amoeba*, a denizen of stagnant waters everywhere. This likeness of motion to that of the animalcule of the pool has procured for the changes of the white corpuscles the term "amoeboid" movements.

Wonderful as it is to think that our blood teems with myriads of these independent living blood cells, it is yet more extraordinary to find that they resemble the animalcule in another respect. The amoeba eats by engulfing its food-particles with its soft protoplasm body. In like manner will a white blood corpuscle feed itself. It will engulf and ingest solid particles which fall in its way, and will reject indigestible matters. That work which we see the white corpuscle doing on the microscopic slide it effects within the animal tissues. We know now, as Dr. Walker knew in 1846, that, in virtue of its independent life, it can push its way through the soft, delicate walls of capillary blood-vessels and pass into the tissues. In place of regarding these locomotive powers as ways and works of unusual character, we now see that they form part and parcel of the complex living mechanism. While it is the duty of the red corpuscles to carry the oxygen breathed into the blood to all parts of the body, and conversely to convey the waste carbonic-acid gas to the lungs, there to be exhaled, the function of the white corpuscles is of far more complicated character. They perform a duty which not only lies very close to the maintenance of the organism at large in a natural sense, but which also bears an important relation to its preservation from agencies that perpetually threaten it with disease and death.—From "The Battle of the Cells," by Dr. Andrew Wilson, in *Harper's Magazine* for June.

THE EASTERN QUESTION, most briefly defined, is the struggle of civilized Europe for the heritage of the Turk. Between the Danube and the Dardanelles, the Adriatic and the Black Sea, lie the most fertile plains of Europe, the most luxuriant crops and the hottest human blood. Centuries ago, the Moslem horde came over from Asia, fought the Christian armies one by one, pushed them ever before it, and was only stopped at last when the very heart of Europe seemed within the grasp of the Crescent-bearing warriors. Slowly the tide has returned as it came. Intrepid Hungary, who stopped its flow, first turned it back. Servia revolted and became free, Greece shook off the turbaned destroyers of her people and her monuments. A few Bulgarian peasants raised the flag of free-

dom, a few Russian officers came to their help, and soon the army of the Tsar Liberator poured across the Balkans to Bulgaria's aid, and she was free. The little fastness of Montenegro had kept itself virgin from the touch of the ravisher. Roumania had already quietly emerged into autonomy, and her gallant soldiers saved Skobeleff from defeat, and enabled Russia to strike the Sultan to his knees. The treaty of Berlin made all this freedom permanent, and permitted Austria to send General Philippovich to subdue the Moslems of Bosnia-Herzegovina and place them nominally in her occupation, but actually within her empire. Then, in 1878, the process stopped. Last year it began again on the familar lines. Macedonia revolted and was suppressed. Armenia revolted afterward. Other Christian races had won their freedom thus, the Armenians said, and why not they? Let them only come to handgrips with the Turk, and Christian Europe would intervene to save them, as she had intervened to save others. But her hope was vain.—From "In the Balkans—The Chessboard of Europe," by Henry Norman, in the June *Scribner's.*

SACERDOTALISM has done much to sever religion from morals by its persistent tendency to exult the value of correct theological belief at the expense of practical morality. In the religion of science such a severance is impossible. The morally right being that which accords with the broad course of the evolution of nature, and the morally wrong that which conflicts with it, any conduct, (in the widest sense of the term) which impedes the soul's development, stands proclaimed as an offense against the morality of the universe. But when this universe itself is regarded as a divine manifestation, an offence against natural morality is seen at once to be an offence also against natural religion.—Norman Pearson on "Natural Requital": *Nineteenth Century* for June.

SPANISH COOKERY.—I do not believe that any one, not even Washington Irving, ever remained so long on the Alhambra's hill. The manager grew so used to us that he gave up providing the French dishes prepared for the tourist; now the waiters brought only their own extraordinary messes, golden with saffron, scarlet with pepper, soft with oil, fragrant with garlic, most of which had hitherto been reserved for the family dinner in the office. We were even made to abstain on Friday, and very flambouyant was our abstinence. In fact, for those who like the rococo in cookery, the Spanish kitchen is unrivaled.—"Lights and shadows of the Alhambra," by Elizabeth Robins Pennell, in the June *Century.*

ENTERTAINMENT FOR THE NOSE.—Why doesn't Mr. Hammerstein, or Mr. Kosterandbial, or some other great show-man, devise an entertainment for the nose? One may pay one's money at the door and go in and have one's ears ravished with beautiful melodies and one's eyes delighted with harmonies and eccentricities of color, but what entertainment one's poor nose gets it must find for itself where it may. Now the pleasures of smell are very notable delights, and by no means to be sneezed at, unless they lawfully affect one in that way. The outdoor smells that one catches as he rides a bicycle along a country road—smells of locust blossoms, wild grape, hay, wet woods, barn-yards, and such like —supplement his other emotions in important measure. Perhaps smells alone would not be quite substantial enough for a whole show, but a spectacle accompanied by music and supplemented by a succession of pleasing and appropriate smells would certainly be worth paying to perceive. There might be some practical difficulty in making one smell succeed another promptly as the scene shifted, but that is only a detail, and it is the surmounting of difficulties in detail that is the successful show-man's strong point, and excuses his exactions at the door.—*Harper's Weekly.*

THE TOMB OF POCAHONTAS.—Entering the town (Gravesend) by the Pelham Road, we come to the White Post Tavern, and must pause to contemplate another spot of interest. Beside the tavern is a little rectangular yard, well covered with grass and surrounded by a flower border. In the middle is a circular flower-bed filled with white tulips, with a solitary rose-bush in its centre. Nothing further marks this spot, and few know that it has a special interest; yet, under that sod is the tomb of Pocahontas.

In the parish register of old St. Marie's Church, which once stood there, is entered:

"1817, Mary 21st, Rebecca Wrolffe, wyffe of Thomas Wrolffe, Gent, a Virginia Ladye borne, was burried in ye chancell."

There is a mistake in the name Thomas, for it should be John. "Mary" is old style for May.

How strange was the fate of Pocahontas! a savage maiden from the primeval forests of America, who died among the civilized white people she loved, far from the land of her birth.—Lieut. John M. Elliott, U. S. N., in *St. Nicholas.*

SYNONYMS, ANTONYMS, AND PREPOSITIONS.—A new volume on "Synonyms, Antonyms, and Prepositions" will shortly be issued by the Funk & Wagnalls Publication House. This has been prepared with great care by the Rev. James C. Fernald, editor of the

Department of Synonyms in the Funk & Wagnalls Standard Dictionary. The editor has carefully discriminated the chief synonyms of the English language, some 6,000 or 7,000 in number, by the same method that has won so much approval in the Standard Dictionary. Taking one word in each group as the basis of comparison, Mr. Fernald defines this clearly and than he proceeds to show how the other words agree with or differ from it, thus the whole group is held to one fixed point. The treatment is in popular and readable style. The book also contains a large number of Antonyms as well as Prepositions, and its closing pages are devoted to Questions and Examples of service to both teacher and student.

The type, brevier, is pleasing to the eye, and the key-words at the top of each page enhance the value of the book for purposes of ready-reference.

PAMPHLETS, REPORTS, ETC., RECEIVED,

Surgery of the Uterus and Kidneys, by Henry Robb, M.D., Cleveland, Ohio.

Ventilation of Railroad Cars, by W. G. Creamer, Brooklyn, N. Y.

Yard Sanitation, by A. E. Regensburger, M.D., San Francisco, Cal.

Limitation of Contagious Diseases, by Frank W. Wright, M.D,. New Haven, Conn.

Rapid Dilatation of the Os Uteri and Delvery, by Harrison Willis, M.D., Brooklyn, N. Y.

Promiscuous Basis in Gynecology and Surgery. Ibid.

Special Influence of Altitude upon Health, Disease and Sanitation, by S. E. Solly, M.D., Colorado Springs, Colo.

Sero-Therapy in the Treatment of Tuberculosis, by Paul Paquin, M.D., St. Louis, Mo.

The Successful Treatment of Chronic Diseases, a Plea for their more Methodical Management, by Simon Baruch, M.D., New York.

The Pathfinders, by James T. Jelks, M.D., St. Louis, Mo.

Sero-Therapy in Tuberculosis. Reports of Cases, by Paul Paquin, St. Louis, Mo.

Cases of Tuberculosis: Aseptolin Edson Treatment, by J. B. Ransom, physician to Clinton Prison, N. Y.

Pollution of Water Supplies, Report of Committee, A. P. H. Association on, Irving A. Watson, M.D., Secretary, Concord, N. H.

Double Salpingo-Oöphorectomy, by Hunter Robb, M.D., Cleveland, O.

Treatment of Pulmonary Tuberculosis, by Irwin H. Hance, M.D., New York.

Check List of the Animal Parasites of Chickens, by Albert Hassall, Bureau of Animal Industry, Washington, D. C.

Ophthalmia Neonatorum, by William Cheatham, M.D., Louisville, Ky.

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SANITARY PROGRESS IN SAVANNAH, GA.*

By J. C. LE HARDY, M. D.

Dr. A. N. BELL, Editor SANITARIAN:

In continuation of my attempt to sketch the progress of sanitation in Savannah, it is clear to my mind that no subject has been so embarassing, indeed, obstructive to it, as

QUARANTINE.

With the experience of two hundred years showing that quarantine has never prevented the return of yellow fever to the United States, and the verdict of the "*Quarantine and Sanitary Congresses*," composed of our best sanitarians, as you well know, which met in Philadelphia, Baltimore, New York and Boston in 1857, 1858, 1859 and 1860, declaring that quarantine was utterly useless as a preventive against yellow fever in default of local sanitary measures; and on the other hand that the disappearance of yellow fever as an epidemic disease in Boston, New York, Philadelphia, Norfolk, Charleston and New Orleans, in the order in which they are named, as soon as proper attention was given to municipal sanitation and to the drainage of surrounding wet lands, is it not remarkable that every successive aldermanic board of Savannah should have continued to enforce, yearly, between the 1st of May and the 1st of November, a quarantine of long detention against vessels coming from latitudes where yellow fever is *suspected* to exist, especially while they have, under their control, a first-class quarantine establishment furnished with all the best and newest appliances for rapid disinfection of vessels and their cargoes, and of the bedding and clothing of crews, and maintain, at great expense to the city, a full corps of competent officers to do the

* Continued from Page 36.

work? Under present quarantine regulations every ship from the West Indies and South America is detained two weeks or longer. One laden with coffee, which left Rio de Janerio in winter, with a clean bill of health, and no sickness on board, was detained 90 days! And the farce of burning sulphur in the hold is still relied upon as a preventive. It seems, however, that no confidence is placed in either one of these methods by those who direct them, from the fact that when incoming vessels have sickness on board, or have touched within a month or two at an infected or suspected port, they are immediately sent to the Marine Hospital Quarantine Station at Sapelo, where they are subjected to similar detention and fumigation before being permitted to return to the Savannah Quarantine Station. As the natural result of such a long and expensive detention at quarantine, our Summer Commerce, once so considerable and so profitable, is now totally ruined, to the injury of every business interest, and to the entailing of great suffering upon an important portion of the laboring people who are thus thrown out of regular employment during six months of the year. Efforts have been repeatedly made by our board of trade and other commercial bodies to induce the City Council to shorten the time of detention, but without avail. Why intelligent men, anxious to see Savannah prosper, should so persistently refuse to abolish or modify the faulty, useless, and ruinous quarantine regulations that were prompted by the fear of yellow fever immediately after the epidemic of 1876, is the question before us. Is it because yellow fever is on the increase? Evidently not, for it is well known that the backbone of this disease was broken at Norfolk in 1855, no epidemic of any consequence having occurred in the United States from that year until 1876. The epidemic at Savannah that year, and the one at New Orleans and in the Mississippi Valley in 1878-79, being as it were its death throes against the resistless force of local sanitation. The few outbreaks that have since occurred show more and more the power of local sanitary measures against the introduction of yellow fever as of other infectious diseases.

Is it because yellow fever has increased in virulence and become more fatal—conditions generally proportional with filthy conditions in localities where it prevails—that the City Council perpetuates this antiquated and fallacious system? This cannot be, for history shows, that at the beginning of this century, from thirty to forty in every hundred persons who contracted the disease died of it, while the mortality during the epidemics of 1876,

at Savannah, and of 1878, at New Orleans, was only 10 per cent.; and in its later visitations at Jacksonville and Brunswick it dwindled to 5 per cent.—a mortality to the number of cases reported to be yellow fever scarcely greater than in our common bilious fevers. Some other reasons for their action must therefore be sought.

The alderman's season in office is so short, and his time so preoccupied by his own affairs (no salary being paid him), that he has no opportunity to study or ability to grasp the question, hence he leaves the question as well as the management of quarantine in the hands of the Health Officer whom he considers an expert. And Savannah's misfortune is, in this respect, that the present incumbent of the office has been in the service for eight years, primarily under the auspices of the Marine Hospital service. He is wedded to the continued policy of that service, in dealing with yellow fever as if it were a contagious disease. His mastery of the fallacious arguments from this point of view, urged in connection with the city's exemption from yellow fever during recent years—for which he claims the credit—are well calculated to influence the minds of the Councilmen in his favor, though greatly to the detriment of the best interests of the city, not only from the restriction of commerce, but by diverting the attention of the city authorities from local sanitary measures.

It was by the exercise of the health officer's influence with the City Council that quarantine was declared against Pensacola and Tampa, on receipt of a telegram from the chief of the Marine Hospital Service that cases of sickness existed in those places of a suspicious character—cases that, after examination, proved not to be yellow fever.

Such precipitate action can only be accounted for by the want of practical knowledge of the nature of yellow fever, or by a disposition on the part of those who exercise it, to take advantage of the ignorance of people under the stimulus of fear, to maintain a pretentious system of preventive medicine alike inconsistent with sanitary knowledge and the interest of the people.

However, some progress has been made, in virtue of the practical lesson—under army regulations—referred to in my previous communication, though the memory of the lesson had well nigh lapsed during the succeeding dozen years, and the consequence was the epidemic of 1876.

GARBAGE REMOVAL.

In the exercise of those sanitary measures, which were revived and pushed so vigorously immediately after the yellow fever epidemic, succeeding officials have become vacillating and ineffective. Party and personal interests have doubtless interfered to prevent the adoption of proper methods for and the prompt removal of garbage and offal, esteemed to be essential for the improvement of the public health, such as using tight and covered wagons, and the daily removal of all refuse before it has had time to putrify, thereby relieving the people from the nauseous odors and sickening sights of dead animals, decaying vegetables and weeds, kitchen garbage and house slops, stable manure, etc., as required by existing ordinances and laws.

One of the aldermanic boards was prevailed upon to build a crematory for the incineration of garbage. It was put up near the southern limits of the city; a competent man was employed to do the work, and sixty-five cubic yards of refuse were daily reduced to ashes, the process being almost odorless. Owing to the neglect and bad management incident to constant changes of administration, the crematory was rendered inadequate to the task of burning garbage, and became such a nuisance that the people living in the neighborhood clamored for its removal. Efforts were made by the Sanitary Association and others to have another and larger crematory built in a central location in order to shorten the haul and thereby diminish the expense and at the same time increase the efficiency of that department; but in this, also, they were unsuccessful. In consequence of this failure more than one-half of the garbage must be hauled by city wagons at least one mile beyond the city limits, and there dumped in large heaps to rot. The favored owner then uses it to fertilize his lands, spreading it over large areas, regardless of the pernicious effect the effluvia must have upon the health of the inhabitants of that side of the city. The privy vaults, of which there are nearly six thousand inside of our extended limits, are the same abomination that they were a hundred years ago. Time and again city councils have been urged to use the pail system, but to no avail. The contents (night soil), removed in the same slovenly, unsightly way of times gone by, are put in barrels and carted through the streets, in the day time, Summer and Winter alike. On account of the filthy condition of the brick sewers underlying the city, the more intelligent part of the community, apprehending some serious epidemic,

have for years urged upon those in authority, the necessity for a separate system of sewers for house drainage, but while each successive board, appreciating the popularity rather than the necessity of this most important sanitary measure, has promised to establish it, we are still using the same storm water drains for sewers; and rather than spend a few thousand dollars, out of the treasury, for the drainage of the newly incorporated suburbs, the inhabitants are forced to use dry wells and cesspools to receive the discharges from water closets and kitchen sinks. This revival of an abomination, condemned as dangerous years ago, has already borne its fruit. Typhoid fever, diptheria and other filth diseases, have invaded these newly built localities. But while some of our city fathers were so averse to spending two or three hundred thousand dollars, for a separate system of house drainage that would promote the health of every man, woman and child, protect the city from dangerous epidemics, and thus render Savannah one of the most healthful cities in the world, others have not scrupled to make her 55,000 inhabitants pay a half million dollars for new water works, long before there was a necessity for them. The discarded water works had a capacity of 5,000,000 gallons per day, derived from an inexhaustable source, the river, and also from artesian wells; a quantity amply sufficient to supply a city of 100,000 inhabitants with water, not only for all ordinary purposes. but also for cleansing every pipe in a system of house drainage and for flushing the storm water drains every day. The only thing necessary, to accomplish all this was to replace the worn-out and leaky mains, laid in 1853, by new ones, large enough to secure an equal pressure in every part of the city and suburbs—a change which was found necessary upon the completion of the new works—to enable the fire department to put out fires in the business sections of the city. Were the 10,000,000 gallons supply, we now enjoy, permanent, and the surplus water judiciously applied for sanitary purposes, the half million outlay would be a mere trifle in comparison with the benefits in health and comfort it would give to our people. But the entire supply, derived from artesian wells, being liable to be cut off by an earthquake, no connection with the river having been provided, we are at all times threatened with a water famine. What will the venerable editor of the SANITARIAN say when told that not a gallon of the surplus five or six millions of water is used to flush our filthy sewers, and that we are not likely to have a separate system of house drainage until, like Brunswick, some serious epidemic will force the authorities to act?

PAVEMENTS.

Even in the selection of materials for paving the streets we find the same diregard paid to the sanitary requirements of the city. All propositions offered by medical men or sanitarians, who have devoted their lives to the study of preventive medicine, or appeals to facts deduced from scientific experiments made in other cities, seem not to have the slightest possible weight in influencing the actions of our city councils. Should, perchance, one of them take into consideration the healthfulness as well as the improvement of the city, and select the best quality of asphaltum because it is impervious to filth and foul gases and is at the same time smooth, noiseless, durable and an ornament to any city, others will insist upon oyster shells or other cheap material, which, if not containing the germs of disease, is ever liable to become a nidus for them and well calculated to promote sickness. Of all pavements, that made of shells is, perhaps, the most objectionable. Nevertheless, shell pavements appear to be the beau ideal of Savannah councilmen. Hundreds of thousands of bushels, in all stages of decomposition, are brought from different places and discharged upon our wharves. They are then spread nine or ten inches thick upon the streets, smoothed over with a heavy roller, covered with cinders and ashes, and again rolled, that is all. On account of the spaces between the shells, there is perhaps no other pavement as well adapted as this for the absorption and retention of filth. This is why it always emits a sickening odor when damp, or disturbed. It becomes a bed of sticky, malodorous slush in rainy weather; while in dry weather it is commingled with the horsedroppings, ashes and cinders, and transformed into a blinding dust, blown in every direction by the wind, permeating every part of the houses and covering our trees, sidewalks and gardens. This caustic disease dust penetrates the air passages of every inhabitant, irritating the mucous membrane of nose, throat, and bronchial tubes; inflames the eyes as well as the air passages, it gives constant work to the doctor and specialist, but to other people it is a very dear pavement in a two-fold sense.

The Belgian blocks, which on account of durability were selected by one of our boards, would make a healthful and invaluable pavement for heavy traffic if the blocks were imbedded in asphaltum or other substance impervious to water, but as they are laid in sand, they are too noisy, too unsightly, and too filthy for the streets of a Southern city.

be remembered as the leader at its meeting at Newport in 1889. It was followed by a resume by Surgeon-General Geo. M. Sternberg, of the U. S. Army, of the "Scientific researches relating to the specific infectious agent of small-pox and the production of artificial immunity from the disease." Dr. C. N. Hewitt, of Minnesota, presented a paper entitled "A Tribute to the Memory of Edward Jenner;" Dr. Francis E. Martin, of Boston, another upon "The Propagation, Preservation and Use of Vaccine Virus;" Dr. Eugene Foster, of Georgia, another upon "The Statistical Evidences of the Value of Vaccination to the Human Race;" while your present lecturer submitted an article upon "The Memorials of Jenner," including monuments, busts, paintings, engravings and medals.

During the week following, the State of Pennsylvania, represented by its Health Board, and the State Medical Society, held a festival, and there were others also in the cities of Baltimore and Brooklyn, N. Y., the latter of which was of extreme interest. The celebration was under the auspices of the Medical Society of the County of Kings, and was very largely attended. Addresses were made by Dr. George McNaughton, Dr. William Pepper, of Philadelphia, late Provost of the University of Pennsylvania, and a Newport resident, the Rt. Rev. H. C. Potter, Bishop of New York, also of Newport; Prof. William Welch, of Johns Hopkins University; Dr. Joseph H. Hunt, and Dr. A. J. C. Skene. The latter said: "The good die young, but this does not seem to be the case with the clergy. My friend, Bishop Potter, is an example of this. They live long, and it is not altogether through vaccination, either." Dr. Pepper spoke strongly in favor of sanitation, and preventive measures generally. "To Jenner," he said, "is due that extreme and rare credit of having devised the incalculably valuable scheme of close and patient observation, without which great discoveries in science are a hopeless dream." "Jenner knew pathology," said Dr. Welch, "and knew it well. His investigations were entirely of a scientific character, and no man in medicine has been less selfish in his work." Bishop Potter's remarks were especially admirable. He closed them by saying: "The clergy have not been always the friends of science, but this is not the case in the matter of vaccination. The Congress of Geneva officially promulgated its theory and gave churchly assent to its practice. No fact in your history is more to your credit than this,

that you have remembered this centennial and have kept it. Certainly nothing in the history of medicine is more worthy of honor than Jenner's great discovery, and whatever honors belong to medicine, none can surpass that due to the great vaccinator. The common indebtedness of all mankind belongs to him. He turned the ray of a new hope upon a timorous and disheartened world."

In Germany there has been a festival. The Russian Society for the preservation of public health, with the encouragement of the Emperor, has also celebrated the centenary with much formality. In Berlin and in St. Petersburg, and in Brooklyn, memorial medals of Jenner have been struck. The Brooklyn medal, as well as several other medals of Jenner, I now show you. At our opening meeting Dr. Turner exhibited to you several portrait engravings of Jenner. Through the courtesy of Deputy Surgeon-General D. L. Huntington, U. S. A., Curator of the Army Medical Museum and Library at Washington, who sent me for inspection the entire collection of Jenner portraits under his charge belonging to Government, some thirty in number, I was enabled to exhibit them at a recent meeting of the Newport Medical Society. To-night, through the kindness of Dr. Joseph H. Hunt, of Brooklyn, I shall show you an equal number, unrepresented in the Government series, from his own superb collection, together with several of my own, unpossessed by either. With them you will notice one of the caricatures that were issued during Jenner's life. I also call your attention to a MS. letter of Jenner, from my daughter's autograph collection, which, if possibly not an original, is a very old facsimile.

The gatherings in honor of Jenner to which I have referred, have been merely of medical men, in the class by whom benefits of vaccination would naturally be most clearly appreciated. It has remained for Newport to rise to a still higher plane, and to set an example that will be quite certain to be followed at the close of another century. Jenner was not only a physician and did good medical work. He was also a profound naturalist, and an universal benefactor, beside whose glory those of all others pale.

The three scientific societies of Newport have therefore united in rendering him their common tribute of gratitude and praise. The Newport Historical Society, through its President, Dr. Turner; the Newport Medical Society through its President, Dr. Rankin, and the Newport Natural History Society, through its President also, have endeavored together to voice the sentiments of the

whole community. That illness prevented my presence at the opening meeting caused me severe disappointment, for my address was ready, and I desired to hear those of my colleagues, of which I had but an abstract when Dr. Rankin made me, that evening, his almost midnight visit. That I could not attend had, however, its compensation, for it gave opportunity to several of my friends to testify, more eloquently than I can hope to do, to their own appreciation of Jenner and his work.

My task upon this interesting occasion is to present to you glimpses into an entirely different portion of Dr. Jenner's life from those previously shown to you, and, if I can, to enable you to appreciate the influences which favorably influenced the moulding of his character, preparing him to become one of the most eminent physicians and one of the most pronounced benefactors of his race that have ever lived. Dr. Turner will have discoursed to you upon Jenner as the maker of an epoch, in general as well as in medical history. Dr. Rankin will have convinced you that vaccination rests upon no mere theory, and that its blessings outweigh ten thousand fold the very occasional complications from constitutional taint in the infant, or carelessness in the preparation of the virus that may attend its use. It is for me to speak to you of Jenner from his ordinarily unappreciated standpoint of Naturalists, and to show you that had it not been for his innate bent in this direction, the very unusual opportunities that he had for observation and experiment, and as the exceptional mental training that he received from one of the most profound and philosophical natural historians that any age has ever produced, his great discovery had never, by him at least, been reached.

To give you the various clues to his permanent two-fold trend of thought, dependent upon which was all that he afterwards accomplished, it is necessary that I take you briefly over ground that Dr. Turner has already partially occupied. I have to do so, however, that I may show you, and combine together, the various influences that controlled his mind. Approached from different directions, the most apparently insignificant points are sometimes found to become the really dominant elements, whether in a landscape or in a man.

Edward Jenner came of an ancient and very respectable family that had long been prominent both in Gloucestershire and Worcestershire.

One of his ancestors was Rev. Dr. Thomas Jenner, President of Magdalen College, Oxford, in the latter part of the seventeenth century.

His father, Rev. Stephen Jenner, A. M. of the University of Oxford, was Rector of Rockhampton, and Vicar of Berkeley, Gloucestershire, and died five years after the birth of his son Edward, who was born on May 17th, 1749, one hundred and forty-seven years ago, lacking three days, from the opening night of this festival.

His mother's father, Rev. Henry Hoad, had also been Vicar of Berkeley, the predecessor of his father in the living, and a prebendary in the Cathedral of Bristol.

He had two brothers, both older than himself, one of them Rector of Rockhampton and Vicar of Little Bedwin, Wiltshire, and three sisters, one of whom, Ann, married Rev. Wm. Davies, Rector of Eastington, and another, Mary, Rev. Geo. C. Black, of Norwood, Middlesex.

His first education as a child was by his brother, Rev. Stephen Jenner.

He was then placed at school at Wotton-under-Edge with Rev. Mr. Clissold, at which time, before he was nine years of age, he had made a collection of nests of the dormouse; and later, at Cirencester, under Rev. Dr. Washbourn. This neighborhood was of interesting geological formation. There was oolitic limestone, composed of rounded particles like the roe or eggs of a fish, and containing remains of extinct lizards, insects and the earlier British mammals, while the lias, another form of limestone upon which the oolitic hills repose, yields corallines, shells, and the bones of fish and great reptiles, the ichthyosaurus and plesiosaurus. In those days, fossil bones and shells were generally believed to be mere stones of curious formation, coincident in shape, but not identical in character with anything in the animal kingdom. These the school boy Jenner collected assiduously, though as yet but dimly comprehending that to those who understood their true nature the study had already become an unending and glorious intellectual feast.

He was next, in 1763, apprenticed to a surgeon and apothecary at Sodbury, near Bristol, Mr. Daniel Ludlow, and remained with him until 1770, when he was twenty-one. It was early in his apprenticeship that he conceived his great idea, and commenced his long continued observations in connection with it, that milkers

who had once been infected by a peculiar eruption upon the udder of the cow became by this secure from small-pox. He casually heard a young woman patient of his instructor say that she could not have small-pox because she had had the cow-pox. Instead of considering this view as merely superstitious or visionary, its importance, if it could be verified, at once took possession of his mind. He was surrounded—the nation was then and always filled—by small-pox in its most virulent and fatal form. Dr. Turner will have told you that at the time not more than four persons in one hundred wholly escaped its ravages. It destroyed a tenth part of all that were born, and frightfully disfigured where it did not kill. The strength of man was weakened and the beauty of woman very generally obliterated. The youth undoubtedly felt already that could he but develop this milkmaid's crude belief, a supreme victory would be wrested from the angel of death. His master and his master's professional friends who must have been told of it, undoubtedly laughed the enthusiastic boy to scorn. Even the magnificence of the idea, chimerical as it must have seemed, could not have been half appreciated by them. That true cow-pox was but a single one of several eruptions upon the udder of the cow, that it was the only one efficacious as a small-pox preventive, and that it was extremely rare even then, the disease often disappearing from the herds for years, so that those that are found spontaneously affected with it are now considered of great pecuniary value, and that cow-pox once contracted by man or woman was artificially communicable to others of our species were facts then wholly unknown. They were successively discovered by Jenner, and form essential parts of the boon that he conferred upon humanity.

It is well that I should state at this point, to prepare you for the subsequent analysis of his character, that though as a youth and subsequently, he sought verbally the opinions of those to whom he was in the habit of looking for instruction and advice, it was more than ten years later, in May, 1780, that he imparted to his friend, Edward Gardner, of Frampton-upon-Severn, while they were together upon the road between Gloucester and Bristol, near Newport, a name most interesting to ourselves, the completeness of his hope and expectation, and it was not till 1798, nearly thirty years from the date when the ferment in his mind began, that he published his "Inquiry into the Causes and Effects of the Variolae Vaccinae." You will see that it was no chance and accidental

discovery, stumbled upon in a blind and blundering way by an ordinary man. If ever there was an instance of reasoning from effect to cause, and again from cause to a much more perfect effect, the most admirable process of the highest mind, it was certainly this.

In 1770, Jenner's apprenticeship at Sodbury being completed, he went to London for the purpose of pursuing his studies still further at St. George's Hospital under the celebrated Dr. John Hunter, with whose family, it has been ascertained by Dr. Turner, the noted Dr. William Hunter, of our own Newport, was directly allied. The pupil and teacher soon proved kindred spirits. He became a resident of Hunter's house, and as an assistant and friend rather than as student merely, he remained there and in this relation for more than two years, the intimacy continuing long after, for over twenty years, until Hunter's death in 1793.

While with Hunter, and at his recommendation, he was employed by Sir Joseph Banks, subsequently president of the Royal Society, to arrange the natural history specimens collected by him and Dr. Daniel Charles Solander—a Swedish naturalist who was afterwards sub-librarian of the British Museum—during Capt. James Cook's first voyage around the world, which was completed in 1771. The intelligent exactness with which he fulfilled this duty led to his appointment as naturalist to Cook's second voyage, which soon ensued. This position, however, he felt compelled to decline.

Jenner had now nominally completed his education, though he always remained a student. He himself tells us that he was the only one of a long line of ancestors and relatives who was not a graduate of Oxford. It has been questioned, however, whether this very fact, his having spent so much of his early life communing with nature in the groves and fields of the country, had not quickened his powers of observation as nothing else could have done, and the very comparative solitude in which he had lived, engendered habits of reflection which the constant change of subjects of thought at the halls of an university might have failed so fully to develop. Many years afterwards, when he had acquired fame, his friends desired that he should become a Fellow of the Royal College of Physicians of England. The Council of that very conservative body insisted that he should undergo the usual examination as to his knowledge of the classics, upon which he exclaimed that he would not take the time to refresh his mind regarding

them for a diadem. "That, indeed," he said, "were but a bauble. I would not do it for John Hunter's museum itself."

In 1773 Jenner obtained his license to practice, and returned to Berkeley, commencing both as a surgeon and apothecary, which were then alike considered as somewhat inferior to the pure physician, to assume whose duties was barred by many restrictions. He is described as a man of moderate stature, rotund, with a short, thick neck, a florid, jovial face, lips indicating love for the table, mirth and good company, a nose quick to express emotion, with eyes of clear gray, and arched brows, a capacious forehead, and hair that became iron gray. By no means handsome, but with goodness in every line. He rode to see his patients in the saddle, in a blue coat with yellow buttons, buckskin breeches, well polished jockey boots, with silver spurs, and carried a smart whip with silver handle. His hair was en queue, or bagged, and he wore a broad brimmed hat. Within doors he dressed in a blue coat, white waistcoat, nankeen breeches and white stockings. He lived, it has been said, "with the generosity of a good man, and the simplicity which befits a great one."

In his now doubtless frequent intervals of leisure he made botanical and ornithological observations, gathered fossils (his general collections and preparations in comparative anatomy would, it is said, have constituted a museum of no mean magnitude), and, follower of Apollo as well as Aesculapius, played on the flute and violin, composed sonnets and sang them at the dinner table, and wrote occasional poems, of which the best are said to have been two addresses to a robin redbreast, and "Signs of Rain." The connection of a fondness for natural history with that for poetry has been often noticed. Virgil, Shakespeare and Cowper; Keats, who wrote of the nightingale; Tennyson, of the owl, blackbird, eagle, the dying swan and talking oak; Moore, of the firefly, the shamrock, and the flying fish; Holmes, of the chambered nautilus. I have not time even to commence the list. Bryant's Ode to a Waterfowl might have been by Audubon himself had he but possessed the sacred fire. Even this society of our own rejoices in an ardent lover of nature, who has most worthily sung her praises upon the tuneful lyre. Jenner's "Signs of Rain" gives evidences of such minute accuracy of observation that I may perhaps be permitted to quote it entire. As a word painting it is delightful.

SIGNS OF RAIN.

An excuse for not accepting the invitation of a friend to make a country excursion.

BY DR. EDWARD JENNER.

The hollow winds begin to blow,
The clouds look black, the glass is low,
The soot falls down, the spaniels sleep,
And spiders from their cobwebs creep.
Last night the sun went pale to bed,
The moon in halos hid her head,
The boding shepherd heaves a sigh,
For see! a rainbow spans the sky.
The walls are damp, the ditches swell,
Clos'd is the pink-ey'd pimpernel.
Hark! how the chairs and tables crack;
Old Betty's joints are on the rack.
Loud quack the ducks, the peacocks cry,
The distant hills are looking nigh.
How restless are the snorting swine—
The busy flies disturb the kine.
Low o'er the grass the swallow wings;
The cricket, too, how loud it sings.
Puss on the hearth, with velvet paws,
Sits smoothing o'er her whiskered jaws.
Thro' the clear stream the fishes rise,
And nimbly catch the incautious flies.
The sheep were seen at early light,
Cropping the meads with eager bite.
Tho' June, the air is cold and chill,
The mellow black-bird's voice is still.
The glow-worms, numerous and bright,
Illumed the dewey dell last night.
At dusk the squalid toad was seen
Hopping, crawling, o'er the green.
The frog has lost his yellow vest,
And in a dingy suit is dress'd.
The leech, disturbed, is newly risen
Quite to the summit of his prison.
The whirling winds the dust obeys,
And in the rapid eddy plays.
My dog, so altered is his taste,

Quits mutton bones on grass to feast;
And see yon rooks how odd their flight,
They imitate the gliding kite,
Or seem precipitate to fall,
As if they felt the piercing ball.
'Twill surely rain—I see with sorrow,
Our jaunt must be put off to-morrow.

Two years later, in 1775, after he had become fairly settled at home, he received a formal proposal from his late preceptor, Hunter, to return to London, and permanently join him in lecturing. Hunter's wish was to establish a school of Natural History, upon a scale then unknown in England. To show to you what this really meant, as an extraordinary endorsement by Hunter of Jenner's attainments as an observer, one fitted to teach, and as a skilled general naturalist, it is necessary that I give you a brief sketch of the great John Hunter himself. From him Jenner had drawn inspiration. Had he accepted Hunter's invitation, he would at once, as his coadjutor, have been placed upon one of the highest pinnacles then possible in the scientific world. At this period Jenner was twenty-six years old, and Hunter forty-seven. The one just entering active life, and the other at its prime. The one already most favorably known, by two years' personal intercourse to Hunter's wide circle of scientific intimates, the other at the very zenith of his fame. The temptation must have been remarkably seductive. Had he yielded to it, Jenner would doubtless have become one of the leading naturalists of his time, but avoiding as he would naturally have done, the field of active practice, smallpox would possibly to this day have remained triumphant, and have decimated us all, while the modern science of biology, for Pasteur, Koch and the host of contemporary observers and discoverers, have but followed in the footsteps of Jenner, as Tyndall and even Pasteur himself have acknowledged, would have been but an universe as yet unrevealed.

John Hunter, besides having a profound knowledge of the human frame, both normal and irregular, was also equally proficient as a comparative anatomist; that is, from having studied similarly an amazing number of the lower mammals, alike as regards their bony, muscular, nervous and other systems, he was intimately versed in their resemblances and dissimilarities to ourselves. He had made special investigations into the physiology of the hiber-

nating animals. He obtained the refusal of all creatures dying in the menageries, at the Tower and elsewhere, and even bought outright rare living specimens, which he allowed to remain upon exhibition on condition that he should receive the bodies at their death. Sir Everard Howe, his brother-in-law, and the treacherous executor who after Hunter's death having his papers confided to him by the Royal College of Surgeons, with whom they had been placed by the English Government, burned ten folio volumes of most valuable memoranda of his dissections and anatomical discoveries, that he might appropriate them as his own—states that as often as he made ten guineas by professional fees, he added something of importance, living or dead, to his immense collection. Upon one occasion he borrowed five guineas from the King's bookseller, G. Nichol, to buy a dying tiger. He purchased two acres of land at Earl's Court, Kensington, where he fitted up a building with every convenience then known for dissection and the preparation of skeletons by maceration, or the softening of the muscular from the osseous tissues, as well as with cages for living animals. In its garden he had a pond where he made experiments on the artificial formation of pearls by oysters. He was so fond of studying the habits of bees that he had several hives of them in his conservatory. He was most interested, however, by the fiercer quadrupeds. Once he was thrown down by a bull which Queen Charlotte had given him. At another time, two of his leopards broke loose, but he himself mastered them, though unarmed. He made to the Royal Society a communication, with anatomical description, concerning a siren, or fresh water amphibian, from South Carolina. He acquired a favorite specimen, the skeleton of O'Byrne, the Irish giant, at a cost of £500. The giant had tried by his will to prevent Hunter from obtaining his skeleton, by ordering his coffin to be securely sunk in deep water, but Hunter bribed the undertaker heavily, and the body was stolen either on its way to the sea or after it had reached its place of anchorage, was taken to Earl's Court in Hunter's own carriage, and was promptly skeletonized. He was always putting questions to nature. Dr. Waterhouse, of this town, and afterwards of Harvard University, of whom Dr. Turner will have spoken, was once told by him that "he loved to be puzzled, for then he was sure he should learn something valuable." He published upon geology, and on paleontology, or fossil bones; on a hen pheasant with cock's feathers and its anatomy; on the organ of hearing on

fishes; on the air receptacles of birds; on the Gillaroo trout; on the eye pigment in various animals; and to show that the wolf, jackal and dog are originally the same. He made experiments on the mode of growth of deers' antlers, which resulted in the great discovery of collateral circulation, when a portion of the blood vessels are cut off or in any way occluded, through anastomising or intercommunicating branches of arteries which, normally very minute, perhaps, are able to become dilated and accommodate themselves to the great currents of blood thus diverted from their usual course. This led him to tie the femoral or main artery of the thigh in a patient suffering from popliteal aneurism, or previously incurable dilatation of an artery in the space behind the knee, trusting to the development of the collateral circulation. The operation was a success, the patient recovered, and a new era in surgery was established. Similar to this, save that it was medical and not strictly surgical—and similarly reached—was the discovery by Jenner.

Such was John Hunter, in many ways resembling Louis Agassiz. His mind, a veritable kingdom, was strewn everywhere with gems more precious than diamonds, and inlaid throughout with what was far more worth possessing than gold. Under such influences was Jenner placed, in most intimate relationship. Stimulated by this example, he became a skillful dissector of the most delicate tissues, and injected and otherwise prepared them with remarkable dexterity. A specimen bequeathed to his friend and biographer, Dr. John Baron, of Gloucester, well illustrates this. It represents the progress of the ovum of the domestic hen, from its first impregnation to its full and complete development when about to be discharged. The vascularity of the membrane investing the ova, as well as the internal condition of the oviduct where the shell is formed, are clearly shown. It was undoubtedly in such embryological researches that he used to delight when with Hunter. Naturally quick to observe, his power of perception had been increased and strengthened. Prone to interpret, his faculties of induction, or reasoning from particulars to generals, from the individual to the universal, from a part to the whole, and of deduction, the reaching a conclusion from certain given premises, had been greatly developed. Ready to see with eyes that were really sightful, and to understand with a mind that was ever open, and to combine what to most men always stood dissevered, and to separate into their natural parts or groups what to the untrained

seemed inextricably confused, Jenner had been as plastic clay under his master's hand. His most salient traits as a naturalist were brought into even bolder relief. From what we know of Hunter's daily life and pursuits, we are made as certain of Jenner's constant occupations and mental development while in his long pupilage and comradeship. To Jenner's latest day he always called him "that dear man."

That Jenner should have declined such an invitation as this to join Hunter, so in harmony with all his tastes and previous training, is probably not to be explained by his modesty and love of the country alone. He doubtless already perceived, though as yet as in a vision, what he was eventually to accomplish, and deliberately placing aside the tempting offer, consecrated his life afresh to the development of his fond idea.

From the commencement of his settlement at Berkeley, where he soon received the offer of an important and lucrative appointment in India, which like that proposed to him by Hunter he declined, John Hunter compelled him as it were still to keep constantly in touch with Natural History. He persuaded him to make observations on the temperature of animals; the habits, sexual peculiarities, and mode of propagation of eels; the breeding of toads; the hibernation of hedge-hogs and of bats; the freezing and growth of vegetables (I shall speak in a moment of his feeding them with the serum of human blood); the parturition of the dog-fish, a small shark, which is viviparous; and other then obscure subjects, and asked him to send him salmon spawn, and the bodies of porpoises and cuckoos, as well as fossils. His interest in all these topics was then running parallel, as it did to the end of his life, with his devotion to his profession. Hunter's letters were greatly valued by Jenner, and carefully preserved. His answers to them were, however, all destroyed, probably after Hunter's death, and by Sir Everard Howe.

During 1780-82 he made most interesting tests of the serum of human blood as of peculiar aid towards the growth of vegetation. In those days bleeding was a remedial measure, and there was, therefore, an abundance of material with which to experiment. Long afterwards, when his son was seriously ill and venesection was thought necessary, he poured the blood serum, as it were a libation, at the roots of a favorite willow which, probably planted by himself, had become a delightful portion of the surroundings of his house. The act was typical both of devotion to science

and of deep love for his son. The underlying sentiment was doubtless a desire to blend two objects that he prized, indissolubly together.

In 1786, while visiting a patient, he was exposed to the full force of a blizzard, and nearly perished. Of the storm, and his experience therein, particularly from the intense cold, he has left a most vivid description.

Meanwhile the seed of the vaccination theory, which had been implanted during his apprenticeship at Sudbury, was still alive in his mind, and slowly but surely germinating. In 1770, as soon as he had reached London, he had spoken privately to Hunter of the common folk's saying regarding the immunity of milkers. Hunter was sceptical, but had told him that the only test of its truth was by actual trial. "Don't think," he said, "but try. Be patient, be accurate." Later, while still in London, he had mentioned it to several other friends, among them Sir George Baker, who received it with even slighter kindness. He now, in the comparative solitude and uninterruption of the country, continued his observations, and his reflections began to assume more definite shape. He ascertained that of several eruptions upon the teats and udder of the cow, immunity resulted only from one, the true cow-pox. In 1780, besides the idea of propagating this artificially from the cow to the human subject, the first thought came to him of conveying it thence from person to person. He even went so far, in 1785, or thereabouts, as to formally bring the subject before two small medical societies in his immediate neighborhood, in whose formation he had taken part. One of them usually met at the Fleece Inn, Rodborough, and the other at the Ship Inn, Alveston, about ten miles from Bristol. This he was wont to term the Convivio-Medical, and the former the Medico-Convivial. At these he would talk of cow-pox, and request his friends to investigate it for themselves. They one and all, however, and invariably, turned the deaf ear, and finally threatened to expel him from the Convivio-Medical if he continued to harass them with what they considered so unprofitable a vagary.

Biding his time, however, he abstained from print in this direction, and his first publication was not as a physician, but as a naturalist. This was in 1787. The paper was communicated to the Royal Society, and was entitled "The Natural History of the Cuckoo." It appeared in the philosophical transactions of that society in 1788, and is contained in Vol. LXXVIII, p. 219, Article

xiv. It is also in the abridged edition of 1809, containing an epitome of the transactions from their commencement in 1665 to 1800, which is at the Redwood Library. The paper will be found in Vol. XVI. of this, at page 432. It occupies ten large quarto pages, and is written with equal clearness and grace. He had made many dissections of the cuckoo, ascertained its usual food, compared its physical peculiarities with those of other birds, and entered in detail into all the phenomena attending its impregnation, gestation and delivery. He discussed its times of appearance and departure, and the reasons that had been alleged concerning, and those that probably governed its curious appropriation of the nests of other birds, and its entrusting its offspring to them as foster-parents, an apparent double perversion of natural instinct on the part both of the cuckoo and the bird that it impressed into its service.

This paper was received by ornithologists with enthusiasm, as explaining satisfactorily a number of mooted questions. It is an axiom, however, that there is nothing good but must run the gauntlet of hostile criticism, and Jenner's paper proved no exception. Mr. Charles Waterton, who to his reputation as a South American traveler and general naturalist had added that of a most accurate observer of the habits of birds, from his unique experiment of surrounding his large estate of Walton Park, near Wakefield, Yorkshire, with a stone wall eight feet high, allowing it to degenerate into a perfect wilderness, and never permitting a shot to be fired upon the grounds, simply that he might make them a safe retreat for the rarer birds and the more timid beasts, challenged the accuracy of his statement as to the infant cuckoo's unaided dispossessing the more ligitimate occupants of its nest. In his article upon "The Jay," contained in his essays on Natural History—several editions of which are at the Redwood Library—Waterton, while carefully refraining from using Jenner's name, denied the fact, no matter by what person of high repute, he said, it might have been asseverated. Defenders of Jenner then appeared, who supposing that Waterton must be correct, attempted to account for the discrepancy by laying stress upon Jenner's having employed his nephew Henry to assist him in making these observations, and by suggesting that the youth might have, so to speak, drawn upon his imagination. I do not myself, however, believe that any such explanation is required. I have carefully examined Jenner's paper, and in it throughout he speaks of him-

self in the first person singular. His opportunities for observation were in this matter equal to Waterton's own, for the cuckoo in that part of England is a common bird, and to this it must be added that Jenner's closeness of observation and veracity in all other matters seem never to have been questioned. He states distinctly that he has himself repeatedly seen the young cuckoo, within twenty-four hours of its being hatched, throw from the nest the hedge sparrow's eggs, and even its young. He still further speaks of the infant cuckoo being able to eject a young bird as large as itself, the hedge sparrow being smaller. He instances two cases where a pair of cuckoo's eggs were laid in the same nest, possibly by different birds. In one of them there were also two hedge sparrow's eggs, one of which was hatched. Within a few hours after the birth of the two cuckoos, on June 27, 1727, these were both thrown out, and then began, says Jenner, "a very remarkable contest. The combatants (the young cuckoos) alternately appeared to have the advantage, as each carried the other several times to the top of the nest, and then sank down again, oppressed by the weight of its burden; till at length, after various efforts, the stronger prevailed, and was afterwards brought up by the hedge sparrows." It will doubtless be the verdict of scientists that Waterton's attack, if not instigated by jealousy, as was that made upon Jenner, regarding vaccination, by Dr. Pearson, of London, may have been through dislike of his occupying what he may have hoped to make his own peculiar field, and that his avoiding Jenner's name directly while using language the object of which could not be misunderstood, was wholly unjustifiable. During this paper upon the cuckoo, Jenner states that he should publish also upon the Migration of Birds, an intention that was not realized until thirty-five years subsequently.

In the following year, 1788, Jenner was elected a Fellow of the Royal Society. Possibly it was passing this ordeal that gave him courage, somewhat late in life, at thirty-nine, to marry during this same year Miss Catharine Kingscote, a refined and gracious lady, who was long an invalid, and died before him. In his early life he had had a severe disappointment, which it took him long to recover from. Indeed it was only through Hunter's putting him at the exacting study of the habits of the hedge-hog that his peace of mind was re-established. The marriage proved a most happy one. He was a devoted husband, extending his care even to the long continued personal preparation of his wife's food, when the

progress of her disease had rendered it difficult to swallow, and in return, we are told, "when vexed and harassed, he knew where to seek refuge; he knew where dwelt love and truth; he knew where to flee from unjust judgments, and to make his appeal where it was never made in vain." He used to observe when speaking of the troubles, trials and sorrows of life, "Mrs. Jenner can explain all these things; they cause no difficulties to her."

His eldest son was born in 1789, and John Hunter was his godfather.

Even during these interesting experiences, with honors coming to him as a naturalist, and his attention no doubt greatly engrossed by his bride, his mind was still constantly adverting to the "Sacred Cow," as the Hindoos had long before called her, and her connection with small-pox. During that very year, which had otherwise been so eventful to him, he showed a drawing of the disease accidentally communicated to the hands of milkers, to Hunter, Sir Everard Howe, Henry Cline and others, but found them still adverse or indifferent. Nevertheless, several of these gentlemen ventured to mention it in their lectures as a curious question, and Cline subsequently became one of his most enthusiastic advocates.

His general practice had now become so large that he relinquished midwifery and surgery, and in 1792 obtained the degree of Doctor of Medicine from the University of St. Andrews. The time was rapidly ripening for the completion and announcement of his discovery. It is indeed not unlikely that he had been consciously waiting for this diploma of full physician, which would enable him to speak to all other physicians as one having their own authority.

In 1793 he published "A process of Preparing Pure Emetic Tartar by Recrystalization," in the first volume of Transactions of the Society for the Improvement of Medical and Chirurgical Knowledge. It is of interest as showing that his proficiency in pharmacy, of which mention has already been made, was based not only upon medical botany and the commercial peculiarities of drugs, but upon chemistry also.

In 1794 he was seriously ill with typhus, or true jail or ship fever, which was then a not uncommon and very fatal disease. During this year he was still continuing his observations upon kine pox. In 1795, still sounding persistently the same string, he experimented upon his own son, then a child of six, whom he had pre-

viously inoculated with swine pox also. One year more, and the crucial test came, the great discovery, of whose practicability and certainty he had so long been convinced. Upon May 14, 1796, he vaccinated a boy of eight, James Phipps, from the hands of a milk-maid, Sarah Nelmes, who had been infected by her master's cows. The boy passed the successive stages of the disease satisfactorily, and on July 1st was inoculated for small-pox, without the slightest effect. It was done to him again and again, the result being the same. From this time forward he made the most extensive experiments, with uninterrupted success. He had ascertained beyond the possibility of doubt, that humanized cow pox was in its earlier removes as efficacious, and could with as great ease and certainty be conveyed from one human being to another, as the original cow pox itself which, as has been stated, it was at times impossible to procure. He subsequently found that it was only at a certain stage of the disease that the virus could usefully, or even safely, be taken.

In 1798 he published his first memoir upon the subject. It was his desire that it should appear through the Royal Society, as his paper upon the Cuckoo had done. Curiously enough, however, it was declined. The fact shows, however, not merely the general scepticism that prevailed regarding the soundness of his views regarding vaccination, for as has already been shown, they were already known to the scientific circles of London, but that he was still considered, even among his friends, as naturalist rather than physician. "He had already gained," the president of the society said to him, "some credit by his communications to the Royal Society, and he ought to be cautious and prudent and not risk his reputation by presenting to that learned body anything which appeared so much in variance with established knowledge and withal so incredible." He then spent three months in London, but in all that time he could not procure a single person upon whom he could demonstrate the process. In 1799 more than seventy leading physicians and surgeons signed a declaration of entire confidence in vaccination. He was urged to remove permanently to London, but refused though guaranteed an income of £10,000, and only occasionally visited it. In 1800 he was requested by the Duke of York to vaccinate the 85th Regiment, at Colchester. Upon examination, however, it was found that the whole regiment, including its women and children, was affected with the itch. It was necessary to wait until it was cured. This is

but an example of his delays and vexations. The early reluctance to vaccination was sometimes overcome in a curious way. In one instance, churchwardens decided that the expense of coffins for small-pox patients was altogether too onerous, and they compelled a whole parish to submit to the gratuitous treatment that Jenner had offered.

In 1801, Blumenbach of Gottingen, who as both naturalist and physician had followed Jenner's two-fold career with the greater interest, wrote him as follows: "As a very warm friend and even teacher of Natural History, I long very eagerly to see your paper on the migration of birds, mentioned in your masterly observations on the cuckoo." In his reply, Jenner confirms my opinion of the reason which was perhaps foremost in deciding him to investigate cow-pox. "Latterly my attention," he says, "has so incessantly been occupied by the cow-pox, I have found it impracticable to wander into *other parts of natural history;* a branch of science which, I know, is the delight of your heart as well as mine." This request undoubtedly recalled his attention to bird migration, and he prepared or finished the paper. It did not appear, however, until after his death, very shortly after which it was communicated to the Royal Society by his nephew, many long years subsequent to its inception. It was published in the Philosophical Transactions for 1824, page 11, comprizing thirty-three pages, and also appears in the Abstract of the Transactions from 1800 to 1830, Vol. II., p. 204. It was not a general history of migration, but an investigation of its causes, based not merely upon observation of the times of arrival and departure of many species of birds, but upon anatomical dissections of the progressive and retrogressive conditions of their reproductive organs, comparison of their food while in England with what they found both to the north and south of it, the duration of time required for the development of their young before and after fledging, etc., etc. Some of his descriptions of birds and their song, and the sequences of this at different hours of the day, are very beautiful, alike inspired by scientific accuracy and poetical imagination.

In 1818 he made some most interesting researches upon the night-blooming primrose, and its part in preserving, in the economy of nature, for the support of a delicate insect (the night moth), what to superficial observers would seem wasted.

Hence, to the close of his life, he was constantly occupied in assisting the vaccine development, and was permitted to see his

process adopted throughout the world. As constantly he was engaged, at every moment of leisure, in searching out the other secrets of nature. In 1821, he was appointed Physician Extraordinary to the King of Great Britain (George IV).

Upon January 26, 1823, he died, from apoplexy, and was buried in his native Berkeley. Only one son survived him. Though appreciated, to a certain extent, at home, it was chiefly from foreign nations that both during his life and after, he received the fullest honors. There are one or two of them that will more particularly interest us, as Americans.

In 1802 he was elected a Fellow of the American Academy of Arts and Sciences, at Boston, his diploma being signed by John Adams as its president, and John Quincy Adams as one of its secretaries.

In 1803 he was granted the honorary degree of LL.D. by Harvard University. This was signed, among other officers, by a relative of my own, and great grandfather of Mrs. Hobart Williams, of this city, Ebenezer Storer, then treasurer of the College.

The 14th of May was long made an annual festival in Berlin, in remembrance of the discovery and its beneficence. It were well should our three societies decide to inaugurate a similar custom in this country. The community cannot too often be reminded of the importance and even necessity of vaccination. Newport would thus, as taking the lead in this matter, become to the world at large, to the medical profession, and to the American people, the object of profound respect.

It is a strange commentary upon the fickleness of the human mind that despite the indisputable proofs of the absolute value of vaccination in preventing small-pox, and of the ever present readiness of that hydra-headed monster to reassert itself in all its former virulence, whenever and wherever permitted to do so, persons should be found in this enlightened age who wish to go back, and to force all others back, to the days of general death and disfigurement. Partly, no doubt, it is but that retrogressive swing of the pendulum, which through inscrutable but invariable law, in all things follows, to a certain extent, every advance of civilization. In part, however, and such, I am told, has been the case in Rhode Island, the regretable agitation against vaccination has been led by persons who have lost by death, and through one of the causes that I have already mentioned—either latent disease of a constitutional character, or carelessness in preparing the virus, which is

now done by wholesale at so-called vaccine farms—a member of their family. To these we must pardon much. In their grief they cannot appreciate that a sequence by no means is always a consequence, and that "after" does not necessarily signify "because of." In condemning the transfer from the cow which has made mankind so much healthier and happier, one might as well insist that all milk, the natural food of childhood, should be disused, because where reasonable care and precautions in its collection have been neglected, disaster has followed.

What might happen even with us in Rhode Island, were the advocates of evil to have their way, is at this moment being shown in England. Berkeley, Jenner's birth place, is very near to the city of Gloucester. In the west nave of Gloucester Cathedral stands a marble statue of Jenner. A prophet is not often honored in his own country. He whom the whole world delights to place on high has usually been thought little of, if not derided, at home. It has been so with Newport and Col. Waring. In Gloucester there have long been, probably from the beginning, persons who disbelieved in the protective power of vaccination. They have been able to prevent its being carried out by the authorities, and as a direct consequence the city is now being decimated by smallpox in its very worst form. The ingress of strangers and the egress of citizens prevented—too many dead for funerals—disfigurement of those who survive, the tale is but that by Defoe, of London, during its awful visitation by the Plague; and as the Great Fire of London alone sufficed to prevent the repetition of that pestilence, so it would seem that Gloucester will still have to be purged of its germs of the most repulsive as well as the most fatal disease, by a general cremation of dwellings and their contents alike. The story is almost like that of Sodom and Gomorrah of old, for is it not wickedness thus to refuse such gifts of God? That those of the anti-vaccination leaders there who are still alive are acknowledging their mistake and urging all to general vaccination, cannot restore the hundreds they have caused to perish, cannot recall the myriad printed sheets of error that they have sent broadcast through the world, to mislead many minds, even in our own city of Newport.

I have now shown you Jenner's life as a naturalist. A few words more will complete my sketch.

He was by inheritance, through several generations, a student.

He was born into opportunity, for his birth place was a district of dairies. His meeting the servant who thought cow-pox and small-pox incompatible with each other, instead of chance would seem to have been but part of a God created design. There occurring at the time in the herd this disease, so very rare, spontaneously, was but another link in the chain.

The prevalence and fatality of small-pox were not his only spurs to find its preventive. While still an apprentice, he had had personal experience of the great discomfort from the older practice of inoculation. "There was," he says, "bleeding till the blood was thin; purging till the body was wasted to a skeleton, and starving on vegetable diet to keep it so."

His inborn love for natural history fixed his attention upon the diseases of the domestic animals. His subsequent training as a naturalist and natural philosopher fitted him for steps in his research which he otherwise could neither have found necessary or taken. It was only by recognizing every successive phase of Jenner's inquiry, each in its turn dependent upon that preceding, that Dr. Waterhouse was enabled to experiment in retro-vaccination, the transference of humanized virus, attenuated by long continued transmission, back to the cow, in the hope of regaining its original certainty and potency; and that, far more effective and successful still, the late Dr. Henry A. Martin, of Boston, followed by Depaul, conceived the idea of vaccinating directly from a spontaneous case in the cow, to other unaffected individuals in the same or different herds. This heifer-to-heifer transmission, from the Beaugency and other stocks, is now practiced throughout the world. "In the first years after vaccination was announced," says Martin (Journal of the Gynaeological Society of Boston, Vol. VII.), "every enlightened physician in Christendom was up to his ears in vaccine experimentation. Every sort of animal from the elephant to the mouse was vaccinated, and even birds. Among thousands of such experiments there was none in which the end sought was the perpetuation of the disease originally occurring in the cow, in similar animals, without passing through a single human system."

Jenner had remarkable patience. The persistence of this we have noticed throughout his life.

He could be wisely silent. Although the object of many unkind and unfair criticisms, he never would weaken the strong position which the truth had enabled him to take, by replying to them.

He had the strongest self control. He once silenced a noble lord, a friend of one of his defamers, who ignorant of his presence was railing most scurrilously at vaccination, by simply confronting him and saying, "Your Lordship, I am Dr. Jenner."

He had the courage of his convictions. Sir Humphrey Davy relates that he was once discussing with Jenner, in 1799, the uses of earthworms to man. Sir Humphrey considered the dung hill and putrefaction far more useful to the worm, than the worm as a benefactor to our race. Jenner would not at all consent to this. He pointed out that in their movements under ground they left a trail of mucus behind them which became a fertilizer to the plants, and that by assisting in breaking the stiff clods to pieces, they divided and comminuted the soil. This holding to his point, no matter who his opponent, was the same characteristic that gave him courage to vaccinate his own child while his friends were still querying as to its advantage or safety.

He saw all things, however repulsive, in their higher, even poetical light. When Charles James Fox, then greatly opposed to vaccination, asked him what the cow-pox variola was like, Jenner replied at once, referring also to the surrounding so-called areola, and the similarity is singularly exact, "Why, it is exactly like the section of a pearl upon a roseleaf."

He built, as a philosopher, upon so secure a foundation that it was unnecessary ever to change. A very few days before he died, he said, "My opinion of vaccination is precisely as it was when I promulgated the discovery. It is not in the least strengthened by any event that has happened, for it could gain no strength; it is not in the least weakened, for if failures had not happened, the truth of my assertions concerning those coincidences which occasioned them would not have been made out."

His tastes were simple and most retiring. He wrote to a friend, after his success had attained full flood: "Shall I, who even in the morning of my days, sought the lowly and sequestered paths of life,—the valley, and not the mountain,—shall I, now my evening is fast approaching, hold myself up as an object for fortune and for fame? My fortune, with what flows in from my profession, is amply sufficient to gratify my wishes. And as for fame, what is it? A gilded butt, forever pierced with the arrows of malignancy. The name of John Hunter stamps this observation with the signature of truth."

He was straightforward and upright from the sense of duty. "In every private affair," says one who knew him intimately, "and in every public transaction, but one principle guided him. The purity of his motives and the disinterestedness of his actions have by no means been yet duly acknowledged. Had those who opposed him known how little of selfishness, of vanity, or of pride entered into his character, they would have deeply lamented the wounds which they inflicted."

He was most humble in spirit. He was compared even during his life time to Columbus, by his previous knowledge foretelling the discovery of another hemisphere; to Newton, compelling even heaven itself to reveal the motions of its hosts; to Bacon, looking forward to futurity for the fruition of the seed that he had sown; and to Harvey, whose marvellous discovery of the circulation of the blood transcended everything then accomplished in medicine; and it had justly been said that in real results he transcended them all. Despite this, he considered himself as merely an instrument in the hands of ever benevolent God. Rev. Rowland Hill, in introducing Dr. Jenner, once said: "Allow me to present to your Lordship my friend, Dr. Jenner, who has been the means of saving more lives than any other man." "Ah!" instantly replied Jenner, "would that I, like you, could say *souls*."

He was consistently devout, ever conscious of and quick to acknowledge the omnipresence of Deity and his own direction thereby. Till fourteen years of age, his whole life had been passed in an ecclesiastical atmosphere. His father, one of his grandfathers and his three early teachers, one of whom was his brother, were all clergymen. His father-in-law and his two brothers-in-law proved also such. He has left a picture of his state of mind during the long years of thoughtful preparation for his discovery. "While the vaccine discovery was progressive," he says, "the joy I felt at the prospect before me of being the instrument destined to take away from the world one of its greatest calamities, blended with the fond hope of enjoying independence and domestic peace and happiness, was so excessive that in pursuing my favorite subject among the meadows, I have sometimes found myself in a kind of reverie. It is pleasant to me to recollect that these reflections always ended in devout acknowledgments to that Being from whom this and all other mercies flow." He was always reverent towards the Scriptures, presenting them to his god-children and other young people in whom he took interest, with little inscrip-

tions, like the following: "To Augusta Bertie Parry, with the best wishes and affections of her god-father, Edward Jenner; who most devoutly hopes, as this is the best book that ever was written, she will give it not only the first place in her library, but convince those who love her dearly that it occupies the first place in her heart."

As was most eloquently stated at the Jenner Festival of the American Medical Association, at Atlanta, by Dr. Davis, of Chicago, Jenner seemed "to look only for the fulfilment of Lord Bacon's saying: 'That it is heaven upon earth to have a man's mind move in charity, rest in providence, and turn upon the poles of truth.'" (Journal of the American Medical Association, 9th May, 1896, p. 917.)

A German memorial of Jenner, which I have received while writing this, from its author, Dr. L. Pfeiffer, of Weimar, who besides being a celebrated medical numismatist, has long been a profound student of the biology of vaccination, closes with these quotations:

From Liebermeister: "Jenner's discovery is the greatest accomplishment that medical practice has ever made in this world."

From Hufeland: "If to any one there is the certainty of earthly immortality, it is he. He will be known to the end of time as one of the greatest benefactors of the human race. Happy he who may have such fortune!"

It is because Jenner was a naturalist, and the philanthropic interpreter of nature's laws that all such should strive to be, that praise like this became possible, and that the whole earth is able to unite in saying of him: "He stood between the dead and the living, and the plague was stayed." (Numbers, lx., 48.)

What more can one add to portray his beautiful character? I can but repeat the following tribute, long since paid him, and inscribed upon his tomb. It will grow more and more expressive with the recurring centuries:

"Within this tomb hath found a resting place
The great physician of the human race—
Immortal Jenner! whose gigantic mind
Brought life and health to more than half mankind.
Let rescued infancy his worth proclaim,
And lisp out blessings on his honored name;
And radiant Beauty drop one grateful tear,
For Beauty's truest friend lies buried here."

FOODS IN DISEASE.*

By George Fisk, M D.
Demonstrator of Anatomy, University of Bishop's College, Montreal, Can.

The varying conditions of the human body in health and disease exert such a powerful influence on digestion and assimilation, that a systematic classification, so useful to the busy practitioner, must necessarily be incomplete and imperfect; or, on the contrary, so elaborate as to be impracticable. The classification of foods, according to their physical properties, source, or chemical formation, is very good in studying the foods by themselves, but in studying foods with regard to disease, a classification, designed to group foods according to the role they take in the formation of the human system is to be desired. As the great objects of food are tissue formation and force production, a classification of foods as acting in one of these ways may prove practical. Chemistry shows that the nitrates are occupied largely in the formation of muscle, the phosphates contribute to the formation of the brain, nerves, and to some extent of the bones, while the carbonates are the main source of force. Let us place the foods as acting in one of these three ways, according to their chemical formation, viz.:

1. Muscle formers, i. e., nitrates.
2. Nerve and brain formers, i. e., phosphates.
3. Force producers, i. e., carbonates.

The material for muscle formation is found largely in the cereals and animal foods, the percentage varying from 6.5 per cent. to as high as 34.6 per cent. Among the grains, wheat has 14.6 p. c.; barley, 12.8 p. c.; and oats, 17.0 p. c., while peas and beans have about 25 p. c. Butchers' meats vary from 17.5 p. c. in pork to as high as 35 p. c. for ham, most of them showing about 20 p. c. Fish show a smaller percentage. The material for nerve and brain formation is found most abundantly in fish. Most fish contain from 3 to 7 p. c., salmon heading the list with 6 to 7 p. c. Grains contain a fair amount. Barley has 4.2 p. c.; oats, 3.0 p. c., and wheat, 1.6 p. c. The phosphates in barley and wheat are deposited on the surface of the kernel, just beneath its hard covering; but in oats it is distributed evenly throughout. The pearly barley is

* Abstract of Paper read before the Montreal General Hospital Clinical Society, March, 1896.

robbed of much of this layer of phosphates in the process of milling, only 0.2 p. c. being left. The flake barley retains much of this layer of phosphates, and consequently is much better for porridge. Butchers' meat contains about 2 p. c., and ham has 4.4 p. c. In fruits, dates are richest, containing 4.5 p. c. Beans contain 3.5 p. c. The force producers are made up principally of the carbonates, i. e., the carbo-hydrates (or, starches and sugars), and the hydro-carbons (or, fats and oils). The carbo-hydrates form a very large percentage of the grain and some vegetable foods, and by their ready oxidization save much wear of the tissues, although they do not readily enter into the formation of tissue. If we consider, then, that all foods, or the component parts of all foods, act in one of these three ways, our care should be to select those foods which best replace the loss in any special case. Here a knowledge of the constituents of the various foods is of vital importance, but this is not all that is required. A selection from the various foods which contain the required elements must be made according to—

1. The ease of digestion, and resulting percentage assimilated.
2. The value in tissue formation.
3. The effects of the residue, or waste, on the system.

The consideration of the first opens up a wide field in the preparation and cooking of foods in order to obtain a large percentage of nutrition from the food. Yeo, in speaking of the partial assimilation of vegetables containing a large proportion of nitrogenous substances, says: "As large a proportion of albuminous matters as 17 p. c. may be wasted, while not over 3 p. c. of the proteid matter of animal food remains undigested." Proper preparation of these vegetable foods will remove this trouble to a great extent, yet it is quite evident that the great mass of cooks do not prepare many vegetable foods rich in nitrogenous products in a manner to obtain its full value. To illustrate, it is well known that the horse extracts more nourishment from oats than man does from the meal, as his powers of digestion are greater. If, however, the oatmeal be thoroughly cooked, from eight to twelve hours, a much larger proportion is assimilated, as the oatmeal granules are broken up and prepared for digestion. It should be a standing rule that wheat and oat porridge should not be boiled for less than eight hours, and on cooling it will form a tender gelatinous mass. Barley porridge is an exception, and a short time (fifteen minutes) suffices to cook it sufficiently.

Much that is valuable in vegetables is lost by faulty cooking. Potatoes peeled before boiling are robbed of their potash salts, which lies just beneath the skin. During the process of boiling the potash passes out into the water, and is thrown away with it. Carrots loose their valuable iron in the same way if sliced, and beets are said to "bleed to death" when the skin is broken. In acute and serious diseases the alimentation is more directly under the physician's supervision, resulting in a more correct preparation of food. Certainly the greatest aid to the physician in the improvements in modern dietetics is the predigestion of food. Its value in both acute and chronic diseases, especially of the alimentary canal, is hardly to be estimated, and the methods of feeding infants have been completely reorganized by it. Not to enter upon a lengthy discussion of the methods of giving predigested foods, I will mention a few facts that are easily overlooked by the uninitiated attendant in regard to nutrient enemata. It is a good standing rule that all albuminous foods should be digested before given as enemata, for, experimentally, albumen is shown to be excreted by the kidneys unabsorbed when injected into the rectum undigested. The practice of giving nutrient enemata with a common Davidson syringe, with a rubber or metal nozzle, cannot be too strongly condemned. Irritation of the bowel, possibly haemorrhage, and imperfect absorption, are the result. A long pliable rubber tube should be used; a large velvet-eyed catheter does very well, and this should be passed well up the rectum to the sigmoid flexure. About eight inches of tubing should be passed up in the child, and about ten to twelve inches in the adult. There is a good anatomical and physiological reason for this, as fluids absorbed from the sigmoid flexure and upper part of the rectum are carried to the inferior mesenteric vein through the superior haemorrhoidal and sigmoid veins, and so on to the liver through the portal vein. The veins from the lower third of the rectum pass directly to the inferior vena cava, consequently all proteid matter absorbed from the lower one-third of the rectum loses the further digestion in the liver so vital to its assimilation. If injected into the sigmoid flexure it causes less irritation, and there is less liability to rejection.

In considering the digestibility of foods their compatibility should be considered. By incompatible foods, I mean those foods which demand a widely different length of time for the completion of gastric digestion. Apples take one and one-half hours, while beets or cheese take six hours. As quickly digested parts of a

meal are ready for intestinal digestion they are passed on from the stomach, leaving the more tardy parts to complete digestion. It is quite obvious that if gastric and intestinal digestion are going on simultaneously for some time both are retarded.

The second division for consideration in the selection of food, viz., their value in tissue formation, is one that is frequently underestimated. Nature always accommodates herself as far as possible to circumstances, and employs whatever material is brought to her for renewing tissue waste. It is quite evident that if inferior material is furnished, the resulting new tissue is of poor quality. This is equally true in mental or physical training, and amounts to a maximum among teachers and trainers. Scrofulous or rickety children show in the various tissues the result of improper food. With regard to what foods make the best tissues, there is room for much discussion. Some hold that flesh food is not allowable for man, while on the contrary others hold that flesh is all sufficient. Thompson remarks that, "A man cannot perform more actual muscular labor upon an exclusive diet of animal food than of starchy food. He requires abundant animal food to replace the general wear and tear of muscular tissue, but the energy for muscular contraction is not derived from nitrogenous food, but from carbohydrates, the former being used merely to keep the muscles in a state of healthy equilibrium. He who is physically feeble, and who lacks muscular power, cannot restore that power by an exclusive nitrogenous diet. A man fed upon nitrogenous diet without vegetable food many not work as well in daily labor as when given a fair proportion of the latter; but, on the other hand, he is better fitted for sudden arduous exertion than are exclusive vegetable feeders." Hence a mixed diet is the rational one for man.

Bauer says: "The material effects of albumen and of fat in the system are in a certain sense opposed, for the former increases the tissue waste, and secondarily, the oxidation, while fat induces the opposite effect." Hence the beef (lean) and bread treatment for obesity.

Some authorities claim that an exclusive vegetable diet has a tendency to increase the deposition of salts in the tissues leading to arterio-sclerosis; but the evidence in this is not at all conclusive. On the other hand a very large per cent. of centurians were very sparse meat eaters.

In considering the effects of the residue, or waste, on the system, I shall define the waste as that part of ingested food which passes off undigested, or is undigestible. The amount of undigested food which is thrown off varies according to the amount of food ingested at a time, and the condition of the food. In many poorly prepared vegetable dishes rather a large percentage of digestible material is thrown off owing to its being protected by indigestible cellulose. If cellulose is added to animal food, digestion is interfered with. The carbo-hydrates in wheaten flour, rice, maccaroni, etc., are utilized to within 0.8 to 1.6 per cent., whereas as much as 8 to 18 per cent. of undigested residue passes out of the body from such food as black bread, potatoes, and the like. Moreover, hard, ligneous substances, such as the bran of black and brown bread, provoke, by mechanical irritation, active intestinal peristalsis, which soon removes these substances from the action of the intestinal juices. For this reason, oat or wheat porridge is a good laxative when cooked only for a short time, while barley porridge is good in cases of diarrhoea. When large quantities of food are taken at once a larger percentage of digestible material is passed undigested. In the case of fats, however, large quantities may be taken without any increased percentage in loss. In considering the nutritive value, vegetable foods are as a rule more bulky than animal foods, hence tend to evacuate a greater amount of undigested residue. This is important in considering the food in cases of intestinal lesions.

In order to facilitate and abbreviate the consideration of the dietetic treatment of each disease, I shall group them into two main classes—acute and chronic; and after considering briefly the main line to pursue in each, shall pass on to consider some minor points which may be of some small practical value.

In all acute troubles the diet should be strictly limited to a fluid, or semi-solid, diet, which will be almost entirely digested. Foods having a large per cent. of residue are contra-indicated, particularly in enteric troubles. Water is most easily assimilated, and consequently is the best vehicle for conveying foods into the system. It is also invaluable in washing away the nitrogenous debris, which is increased in quantity owing to increased metabolism. In the acute cases, where the fever is high, it is considered well to aim at preventing the increased metabolism of nitrogenous tissues by supplying albuminous foods, which are consumed in their stead.

Emaciation is to some extent limited in this way, and the patient's strength is thus reserved.

I will pass over without comment that universal food, milk, which is so valuable in all acute troubles, and will consider a few points regarding farinaceous gruels. In a certain percentage of cases, a milk diet is but poorly borne, and at best soon becomes tiresome. A discriminate use of carefully prepared farinaceous gruel goes far to supply the need in these cases, and probably are of more dietetic value than the great majority of meat broths, which, in nutritive value, are little more than a saline solution, with some gelatine and extractive matters. Stomeyer feeds his typhoid fever patients largely with oaten grits boiled for three hours without sugar. In some forms of enteric fever, with great emaciation, farinaceous gruels are strongly indicated. They must not be given too sweet, and a little cream or lemon juice may be used instead of sugar. It is often advisable to add a tablespoonful of malt extract, or some of the prepared foods, as Mellin's, Ridge's, etc. Some object to these gruels, on the ground that they cause tympany. If this is troublesome, some of the difficulty may be removed by predigesting the gruel.

In chronic diseases the diet differs very largely with each affection. In order to prescribe a dietary for a patient, a careful analysis of the condition present will suggest the requisite elements to remedy it. On comparing the foods having the necessary elements, a selection should be made with some regard to the occupation of the patient. If the patient is an educated person, and has been following a sedentary life, using his mind more than his body, a selection of foods having a large proportion of phosphates is advisable. If the patient is a laboring man, with muscles developed more than nervous matter, foods rich in nitrogenous material will more readily regenerate. If the patient is a young, poorly nourished child, with a nervous, irritable disposition, and a suspicion of rickets, a diet rich in phosphates is indicated.

To the delicate neurasthenic lady, who has never developed her muscular system, and who is not called upon to resist cold, the nitrates and carbonates are not so necessary as to the convalescent school boy who is preparing for his athletic games, to be indulged in regardless of heat or cold.

I dare say that it would be consoling to the school boy to know that his overpowering appetite for all sweets is not a pernicious

one, but a lusty call of nature for one of the most available force producers.

In prescribing a course of diet, it is well to give as large a variety as the case will allow. In some chronic cases, such as diabetes and nephritis, the diet is unfortunately so limited that it must inevitably become tiresome. Some small variety can be gained in these cases by varying the form of preparing the food, introducing new flavorings, etc. In private practice it is almost impossible to carry out to a satisfactory termination many of the reputed diet cures for various diseases, such as the various "milk cures," "whey cure," "Koumiss cure," "grape cure," etc. Not a small factor in these cures is the change of climate and other helpful changes which usually accompany a course of treatment.

It is refreshing to see that in the most advanced training schools for nurses, special attention is given to the culinary department. Nurses are thoroughly trained in the methods of preparing these various foods, and consequently eliminate any chance of serving their patients with food that will aggravate their trouble rather than nourish them. This is a step in the right direction, which I hope will soon be followed by the establishment of a chair of Dietetics in our universities. To-day the student is instructed in the elaborate methods of preparing tinctures and fluid extracts, and all the million and one drugs of which he is unable to remember even the names, and yet his course of instruction as to the value and action of the various foods is meagre in the extreme. He is not asked to write the formula or directions for preparing any special food; he has never prepared these foods himself, and for all the assistance derived from his medical studies he could not even say whether a food was properly prepared for his patient or not.

To the physician an exact knowledge of foods is the key to success in many cases; to the anxious mother, striving to prepare some tasty morsel, each fresh hint from the physician is seized with gratitude, and forms a further bond of union; and as to the sick, who can measure their joy at the appearance of some fresh article of food to their limited bill of fare?—*Canada Medical Record, June, 1896.*

SCHOOL-ROOM HYGIENE.*

By WILLIAM A. MOWRY, of Hyde Park, Massachusetts, Chairman of the Committee on School Sanitation, Hygiene and Physical Training.

We are living in an educational age. The electric light is turned in full blaze upon the schoolroom. The American system of public schools is under discussion and subject to criticism everywhere.

It is remarkable that, with all the discussion and all the improvements in these different directions, so little progress has been made in school sanitation. The public is not yet awake to the fact that the laws of health should be regarded as the basis of the entire work of education. In the new palatial schoolhouses lately built much attention has been given to lighting, heating and ventilation, but the old schoolhouses are vastly in the majority, and they remain just as bad, and a little worse, than formerly. It is greatly to be feared that but few, even among the educators themselves, are aware how horrible the hygienic and sanitary conditions are, all over the country. Here and there a few thoughtful persons observe the facts, and speak out plainly and forcibly. Too often, however, their words are as the idle wind. Sometimes nothing is done; often only spasmodic efforts are put forth to improve the situation.

Some years ago statistics were obtained from the large cities of the country concerning the amount of floor space and air space, per pupil, in the schoolhouses. In one large eastern city, having more than 1,200 schoolrooms, it was found that the average of all the rooms gave less than seven square feet of floor space and less than ninety cubic feet of air space to each pupil. Several cities showed an average of less than ten square feet of floor space and less than 100 cubic feet of air space to each pupil, and only one or two cities at that time, in the whole country, gave, on an average, sufficient floor space or air space. Those who have inquired into the existing conditions in these respects know full well what a crying evil this is. Little children, huddled together six hours a day in schoolrooms with only five, six, seven and eight square feet

* Abstract of paper (Buffalo *Commercial*, July 6) read at Teachers' Convention, Buffalo, N. Y.

of floor space to each one, breathing the air from 50 to 100 cubic feet of air space allowed to each one, with a totally inadequate supply of fresh air from all sources, is a crime against nature, and the conditions are aggravated by compulsory laws in many states obliging the children to attend the schools.

The authorities in Paris 20 years ago claimed that each pupil should have from 250 to 280 cubic feet of air space, with a change of from 400 to 500 cubic feet per hour. This estimate is far too small. They also stated that "any heating apparatus that does not provide for regular change of air in some form is injurious to health." Dr. Buck, of New York, asserts that "we expire from 14 to 20 cubic feet of air per hour, requiring 200 times that amount of fresh air to dilute it to a health basis, or 3,500 cubic feet per hour." The leading modern writers vary in their estimate of the amount of the fresh air supply needed, their figures ranging from 2,000 to 3,500 cubic feet per hour for each person. It is now generally agreed that the necessary floor space for each pupil in a schoolroom should not be less than 25 square feet, and with the best ventilating appliances every schoolroom should furnish 300 cubic feet of air space per pupil.

Severe charges are frequently made by occulists against the schools. They assert that studying injures the eyes, and that the schoolroom is responsible for numerous cases of defective eyesight. Doubtless in many instances these charges are true. Hence, it has come to be quite generally admitted that the work of the schoolroom is necessarily antagonistic to good eyesight. It is believed, however, that under proper conditions the reverse is true. The evils complained of are chiefly the result of wrongly constructed schoolhouses and bad seating. Many illustrations of this statement could be given. In a school of 200 boys, located in one of the eastern cities, examinations were made some years since which tend to show that, under proper conditions, school work is not deleterious to the eyesight. A new schoolhouse had been built with due regard to proper light. In every room the light came in upon the left side of the pupils. The surface of the window glass was equal to 10 per cent of the surface of the floor. No seats were placed more than 30 feet from the windows. The top of the windows was 12 feet from the floor. An eminent oculist examined the eyes of the 200 boys, and made a careful record of their condition. Two years later a second examination, and two years after that a third examination was made. The result showed that,

in general, the condition of the eyes was better at the end of the four years than at the beginning. A few cases of myopia existed, but the increase of the difficulty during these four years was less than is ordinarily the case with boys of the same age.

In regard to the heating of schoolhouses, it ought to be laid down as a principle, and agreed to by every educator, that no system should be employed which does not furnish the heat by indirect radiation. Whether from furnaces, steam pipes, or hot water pipes, fresh air should be heated and sent into the schoolroom in sufficient quantities to answer the demands both of heating and ventilation. It must, of course, be borne in mind, that, if fresh air is introduced into the schoolroom, there must be ventiducts sufficiently large to carry off the vitiated air. The overheating of schoolrooms is altogether too common, and frequently is the fault of the teacher. Ordinarily the temperature of the schoolroom should be kept not over 68 degrees.

The proper seating of the schoolroom is to-day certainly a matter of great importance. Perhaps it should not be regarded as of greater consequence than lighting, heating and ventilation; but possibly just here the educators of America and the people at large are more backward and less successful in the discharge of the duty they owe to the rising generation than in all other matters relating to school hygiene.

We have discarded the long desks and long plank seats behind them, and have adopted the single desk and seat. Within a few years attention has been turned, both in America and Europe, to the production of adjustable desks and seats. This is a great gain. The adjustability, however, as yet has proceeded only so far as the height of the seat and the height of the desks are concerned. Adjustable desks and seats ought to be provided everywhere. It may not be economy to displace all existing desks and seats and replace them with those which are adjustable, but at least a few of them might forthwith be placed in every schoolroom. The adjustable seat and desk is an important invention, and the manufacturers are entitled to great credit for producing them and urging upon the community their adoption.

A very important point is the distance between the back of the chair and the edge of the desk. Throughout the whole country, with but few exceptions, this distance is too great. The average child of five or six years requires a space between the back of the chair and the desk of seven to eight inches. In order to have free-

dom of movement, this space, for the youngest children in school, should be nine inches. Many a primary schoolroom in various parts of the country will show this distance to be twelve inches and over, and in not a few instances even as great as sixteen inches. In academies and high schools the largest distance ordinarily required between the back of the chair and the edge of the desk should not exceed thirteen inches. The true scale, therefore, from the primary school to the high school would range only from nine to thirteen inches. Think of a little child, whose body from front to back measures but eight inches, sitting upon a seat with twelve or fourteen or sixteen inches' space between the desk and the chair back! How shall the child sit? If he is to sit back in the chair, as he ought to sit, he will be too far away from the desk for study or writing. If he brings his body into a proper position for using the desk, either in writing or as a rest for his book, he must sit upon the mere front edge of his seat. Moreover, what temptations this condition of things offers for sliding the body downwards under the desk, and sitting with his shoulders only against the chair back.

The preceding discussion by no means covers the whole ground of school hygiene, but is designed merely to call the attention of this council to several important defects in the present working of our school system, and to suggest concerted action along a few lines only, looking towards a remedy for existing evils. Your committee would therefore beg to make the following suggestions:

It is high time that the authorities in the large cities should inaugurate a system of expert examinations with reference to the hygienic and sanitary conditions of their city schools.

We would respectfully represent to the several state departments of public instruction, that, in our judgment, such departments can render no better service than by causing to be made, by a competent commission, wisely appointed, an exhaustive report upon school hygiene, to be widely circulated, and giving to the community information universally needed. Such a report should be the result of the most careful study and inquiry into the various questions constantly arising concerning good sanitation and hygiene; and it should give due attention to the wants of both country and city schools—large schoolhouses in towns and one-room buildings in rural districts.

We would urge, with strong emphasis, the leading manual training schools, technical schools and universities in our country to incorporate into their courses the careful study of school sanitation and hygiene.

Your committee would further distinctly emphasize the importance of more extended instruction for the teachers of the public schools of our country upon this subject of school hygiene, such instruction to be particularly given in teachers' institutes, summer schools and normal schools.

The best results will not be accomplished until cities shall extend the proper power and authority and place the needed responsibility for better results in these directions upon the city superintendents.

SANITARY REGULATIONS FOR PRINTING ESTABLISHMENTS IN GERMANY.—Under date of September 27, 1895, Consul Stephan, of Annaberg, transmits the following:

A conference of proprietors and employees of printing establishments, called together by the Government, was held in Berlin at the beginning of August to discuss the condition of the workrooms in printing houses and type foundries, and to agree upon sanitary orders to be issued. It is interesting to note how the conference arose. When the printers undertook their great strike in the winter of 1891-92, which ended in failure, the workmen declared, among other things, that the printers had inscribed the nine-hour day upon their banner primarily because the sanitary condition of certain printing establishments was beyond all description. The Government decided to institute an inquiry into the diseases peculiar to the trade and the causes of deaths among the printers. They applied, for this purpose, to the local sick funds, and received from these information which was certainly far from satisfactory—one-half, or even two-thirds, of the employees were said to be suffering from lung diseases. It is admitted by the employers that some small presses are set up in unhealthy rooms; on the other hand, the large newspaper presses are established on the most suitable premises which one could desire. Excellent arrangements are made for light and air, and new improvements are constantly being made. The Government has drawn up sanitary regulations for the printing establishments, and the conference was to express an opinion upon them. Representatives from all large printing places were present; several delegates

of the trades union were also in attendance to consider the Government scheme. On the whole, the bill met with approbation; it was drafted so as to bring the larger establishments within the requirements, leaving only the smaller concerns yet to comply with the law. This arrangement, however, did not meet the wishes of the workmen's representatives.

SAFETY IN CAISSON WORK.

CONSULAR REPORT.

The building of bridges, where the foundation for pillars has to be laid under the water, has always been accompanied with much danger to the lives of workmen who are compelled to work in caissons. Investigations by Rameaux, and more especially by Paul Bert, have fully demonstrated why air compressed beyond a certain degree is dangerous to animal organism.

Dr. Neudorfer, an Austrian authority, suggests various methods for obviating these dangers, and has made a scientific study of the subject. There are two things that the workers in caissons have to guard against:

(1) The concentrated oxygen, which, at a pressure of five atmospheres, affects the nervous system injuriously, causing cramps tetanus, diminishing oxidation, and the formation of carbonic acid gas. It has been proven by experiments on men and animals that when there is an increase of 20 per cent in the amount of oxygen, the process of oxidation in the body is less rapid, less carbonic acid gas is formed, and the heat of the body is diminished. This first danger is the least serious, as the pneumatic pump causes a gradual compression of oxygen to which the system generally adapts itself, and in any case there are premonitory symptoms which make it possible to remove the workmen before the case becomes dangerous. Little inconvenience is caused until the pressure exceeds four atmospheres.

(2) The concentration of nitrogen, which affects the blood instead of the nervous system. With the increase of pressure, the nitrogen becomes more and more concentrated and the absorption of this gas by the blood increases proportionately, when a decrease in the atmospheric pressure absorbs a smaller quantity of nitrogen,

allows the gas to escape in fine bubbles which circulates through the veins and prevents the blood by its expansion, from circulating in the capillary vein. This checks the flow of arterial blood and affects the spinal column and the brain. In experimenting with animals, death is caused instantaneously when a high pressure is suddenly reduced. The best method for obviating this danger is to reduce the pressure slowly so that the blood can get rid of the free nitrogen gradually. At the entrance to the caisson there should be a separate compartment filled with compressed air. When the workman desires to leave his work he should shut himself in this compartment and gradually reduce the pressure by letting the compressed air escape.

According to the opinion of Dr. Neudorfer, of Vienna, an hour and a quarter should be spent in reducing the pressure of 3½ atmospheres in order that the risk may be as small as possible. The decrease of pressure is regulated according to the regulator of Denayrouze.

In cases where, in spite of all precautions, a workman is affected, inhalations of pure oxygen are found to be the most simple and effective remedy.

MAX. JUDD,
Consul-General.

VIENNA, *October 3, 1865.*

A FOUL AIR INDICATOR.—At the Industrial Exposition at Zurich, Switzerland, there is exhibited an air tester which is designated to show whether and in what degree the air in a workshop or other inhabitated room is contaminated. The apparatus is described as consisting of an air-tight closed glass vessel filled with a red fluid. Through a glass tube that dips into the liquid and is bent at the top a drop falls every 100 seconds on a cord that hangs beneath and that is somewhat stretched by a weight. The fluid from which the drop comes has the property of changing its color by the action of carbonic acid. The more carbonic acid there is in the air the quicker this change in color takes place. If the air is very foul the drop becomes white at the upper end of the cord, while the change of color corresponding to a slight proportion of carbonic acid does not take place till the drop has run further along the cord. The exact condition of the air can be ascertained by observing a scale that is placed alongside the cord and divided into convenient parts, bearing the designations, "extremely bad," "very bad," "passable," "pure."

FIFTY APHORISMS ON ALCOHOL.

By J E. Kempf, M. D.

Aphorism 1. By alcohol is meant the representative of a class of chemical compounds having in common certain characeristics.

2. Alcohol is produced by fermentation of saccharine substances, from which it is separated by distillation.

3. Alcohol is a transparent, colorless, mobile, and volatile liquid of a characteristic pungent and agreeable odor and burning taste. Specific gravity 828.

4. Fusel oil, an amylic alcohol, an oily, nearly colorless liquid, is an impure and very poisonous substance.

5. Whisky is made of corn, wheat, or rye, by distillation of the fermented grain. It has an amber color, a distinctive taste and odor, and its specific gravity is 930. Whisky varies in the amount of fusel oil it contains.

6. The following table is accepted as reliable concerning the per cent. of alcohol contained in alcoholic liquors commonly sold and used:

Brandies, gins, and whiskies	48	to	56	per cent.
Sherry and port	20	to	33	"
Claret and hock	8	to	11	"
Ale and porter	6	to	10	"
Beer	4	to	6	"
Stout			4	"
Sweet wine	10	to	17	"

7. Fifteen grains of alcohol per two pounds of the body-weight is considered the limit per day for health; 30 grains of alcohol per two pounds causes intoxication; and 120 grains per two pounds will cause death in from twenty-four to thirty-six hours.

8. The physiological action of all alcoholic liquors does not differ from pure alcohol in the same stage of dilution. But pure alcohol diluted is less toxic than impure whisky, or any other impure alcoholic drink. Brandy being a purified wine is in a diluted state less toxic than the wine. Alcoholic liquors may be adulterated in such a way that they are more toxic than pure diluted alcohol of the same per cent. Red wine is more intoxicating than white wine, not because it contains more alcohol, but because the latter is produced by the fermentation of the grape juice, whereas the red wine is the product of the juice, skin, and pips of grapes.

9. The physical constitution, the stage of health, and the condition of the mind have much to do with the quantity of alcohol a person can stand.

10. There are conditions and diseases occurring in the human system when alcohol may be used as a medicine and as a food, and proves of great benefit, often saving life if properly used.

11. In some conditions, such as poisoning from snake-bites, large quantities of alcohol can be taken into the system without causing any effect except counteracting the poison already in the system. In such cases it acts as an antidote.

12. In other conditions, such as the rheumatic diathesis, the smallest quantity of alcohol is hurtful to the human system. For this reason the physician makes it a point to forbid rheumatic patients all alcoholic liquors of any kind or in any quantity.

13. The toxic quality of alcoholic drinks is not thoroughly evident when there is no kidney nor liver trouble, nor a diathetic disease. Healthy subjects easily eliminate these toxic substances, which under certain circumstances may even be valuable as occasional stimulants. In other words, death does not readily occur from the acute toxic effects of alcohol unless there is some constitutional defect.

14. The greatest portion of alcohol taken is used up in the system. Only about 16 per cent., even if taken in large quantities, is excreted through the breath, the skin, and the kidneys.

15. Alcohol, it is supposed, is stored up in the system. It has been found in the ventricles of the brain, and has been distilled from the brain substance.

16. In small doses alcohol increases the action of the heart and cutaneous circulation; a slight rise of temperature is observed and all the functions are for a time stimulated.

17. A considerable dose of alcohol exhilarates, excites, and slightly intoxicates.

18. A large quantity of alcohol causes loss of muscular power, impaired co-ordination of voluntary movements, and rambling incoherence.

19. A poisonous dose of alcohol produces profound insensibility, stertorous breathing, and muscular resolution. For this reason alcohol is classed with the narcotics. The poisonous dose of alcohol cannot be estimated.

20. Alcohol produces a sensation of heat on the skin followed by inflammation. It hardens the same by coagulation of its albumen and the abstraction of water.

21. In small amounts alcohol increases the temperature of the body. In larger doses it lowers the same from two to four degrees, Fahrenheit scale, the normal temperature being 98.5°. This is due to an excess of heat dissipation caused by the drug. The waste of alcohol absorbed by the system produces less heat than the waste of the carbo-hydrates (fats), which is not used when there is alcohol in the system to be burnt up. The capillary dilatation and the free sweating produced by the alcohol also helps to lower the temperature of the body.

22. Alcohol diminishes the power to resist cold.

23. Alcohol increases the flow of saliva and aids digestion when taken in small amounts. It produces a feeling of warmth in the stomach, and the alcohol being quickly absorbed the warm feeling passes over the body. A larger quantity causes a congestion of the stomach, gives rise to a pathological secretion, a gastric catarrh, epigastric pain, vomiting, purging, a gastritis, and a degenerative change.

24. Small doses of alcohol increase the heart-beat, and large amounts depress the same, both through a direct cardic action. The arterial pressure rises and is depressed in the same way. Alcohol in small quantities stimulates the heart, increasing its action in frequency and force, and causing a dilatation of the cutaneous capillaries and those of the brain; witness the flushed face, the glistening eye, and the increased animation.

25. In a poisonous dose of alcohol the heart's action is lessened, but the heart is the last to succumb. After volition and voluntary motion stop, and the voluntary muscles are paralyzed, and respiration ceases, then the heart finally gives way and quits beating.

26. In large doses alcohol enhances coagulation of the blood. In toxic quantities it destroys the ozonizing power of this fluid, causing a separation of the hemoglobin from the corpuscles. In this way it brings on a toxemia.

27. The amount of alcohol absorbed varies and is practically unknown. The drug lessens the excretion of tissue waste both in health and disease. It diminishes the absorption of fats, and increases the action of the kidneys. In large amounts it produces cirrhotic changes, especially of the liver and the spinal cord.

28. In small doses alcohol has little or no effect on the respira-

tory functions. In large amounts it produces a depression of both rate and depth of the respiration through a direct action on the centers in the medulla oblongata. The death "from a drunk" is caused by paralysis of the muscles of respiration.

29. Alcohol is a narcotic which spends its powers chiefly on the nervous system. It diminishes or suspends the functions of the cerebrum after a preliminary stage of excitement.

30. In small amounts alcohol excites and in large doses depresses both the peripheral, motor, and sensory nerves.

31. Excessive quantities of alcohol cause a spiral degeneration of the axis-cylinder of the nerve fibers.

32. Reflex action is at first increased and afterward diminished by an influence exercised by the drug upon the spinal cord and the nerves.

33. A small quantity of alcohol stimulates the cerebral functions and a large quantity depresses and then abolishes them.

34. Alcohol causes a lack of co-ordination by depressing both the brain and the spinal cord.

35. Toxic doses of alcohol produce hyperemia of both brain and spinal cord, especially of the lumbar enlargement of the latter.

36. The primary effect of alcohol on the brain is stimulation, increasing the functional activity of the brain—ideas flow more freely, senses are more acute, muscular movements are more active; next, the activity changes to excitement—ideas become incoherent and rambling, the muscular movements uncontrolled and incoordinate, an over-stimulation of the cells of gray matter.

37. A poisonous dose of alcohol causes the functions of the brain to be suspended, and complete unconsciousness ensues, the reflex movements cease, the functions of organic life are feebly performed, and the centers presiding over the movements of respiration and circulation are finally arrested.

38. The sympathetic system is especially affected by alcohol, as shown by the increased blood pressure in the first stage followed by capillary dilatation, and marked fall of pressure in the later stages of alcoholic intoxication.

39. The pneumogastric or vagus is the cranial nerve absolutely essential to life, because of its functions in connection with the heart and lungs, and its relation to the sympathetic system of nerves. Alcohol paralyzes the centres of this nerve and thus produces death by stoppage of the respiration and, last, of the heartbeat.

40. Signs of poisoning from alcohol are (*a*) odor of breath, (*b*) contracted or dilated pupil, (*c*) muscular resolution, (*d*) slow, sighing, irregular, stertorous breathing, (*e*) laxness of the muscular system, (*f*) abolition of reflex movements, (*g*) stupor and coma, (*h*) death.

41. Treatment of poisoning from alcohol consists of, (*a*) evacuation of the contents of the stomach with the stomach pump (nature often does it by vomiting), (*b*) inhalation of ammonia, (*c*) cold to the head, (*d*) warmth to the body, (*e*) faradism of the muscles of respiration.

42. *Post-mortem*, (*a*) hyperemia of gastric mucous membrane, (*b*) distension of right cavities of heart and of the great venous trunks, (*c*) hyperemia of cerebral meninges, (*d*) serous effusion into the ventricles and arachnoid spaces.

43. Alcohol may produce toxemia, which may show itself in insane impulses, acute insanity, delirium tremens, dipsomania, and chronic insanity.

44. Alcohol may and does predispose the habitual user to acute diseases.

45. The habitual user of alcohol cannot overcome the effects of acute diseases as readily as the abstainer.

46. Alcohol if habitually and excessively used may cause diseases of the kidneys, liver, stomach, lungs, heart, spleen, pancreas, and of the cerebro-spinal system of nerves. These diseases may consist of inflammations or degenerations.

47. Alcohol increases the ravages of tuberculosis, syphilis, scrofula, rheumatism, and other diathetic diseases, and persons suffering from these diseases cannot easily eliminate the toxic substances of alcohol.

48. Alcohol is not necessary to the healthy person, even as a stimulant in fatigue.

49. Alcohol may and does bring on a habit in the system so that the user becomes a slave to the drug, but only in such as are predisposed to it by idiosyncrasy, heredity, or degeneration of the will power of the brain.

50. Alcohol is a useful drug, but should not be used habitually, no more than should opium or any other drug.

[NOTE.—Being asked to serve as an expert on alcohol in a damage suit brought by a widow against a saloon keeper for selling whisky to the husband, which it was alleged caused his death, I formulated the foregoing aphorisms as a guide in testifying.] —*The American Practitioner and News.*

PLAGUE OF MICE IN RUSSIA.

CONSULAR REPORT.

During the years 1893-94, and extending into 1895, the agricultural interests of Russia suffered serious loss, owing to the destruction, by numerous varieties of mice, of the growing crops, as well as grain in stacks. The extraordinary number of these mice, the great destruction caused by them, and the efforts made to exterminate them are best indicated by quoting the answers to my request for information from the authorities of five of the most important agricultural districts within the range of this consular district.

The governor of Bessarabia writes:

(1) The large number of mice which appeared in the autumn of the year 1893 in the south of Russia embraced the following well-known species: *Mus musculus* (house mice), *Mus agrarius* (field mice), and *Arricola arvalis* (also called field mice), but *Mus musculus* predominated.

(2) The extraordinary rapid multiplication of this army of rodents is attributed to two consecutive good harvests, in consequence of which much grain remained in stacks unthrashed, and to the autumn of 1893 having been very mild.

(3) The mice multiplied on the spot and no migration was observed, which is also corroborated by their simultaneous appearance in Bessarabia and in the adjoining provinces.

(4) The mice appeared in the autumn of 1893 and attained their largest numbers in the autumn of 1894, after which they began to decrease, so that in the spring of 1895 no further complaints regarding them were heard. The damage caused by them is considerable, but has not been exactly ascertained, because there was nothing to go by.

(5) No particularly energetic measures were taken against the mice, because no thoroughly satisfactory means of combatting them had been discovered. Among the various measures adopted, mention must be made of holes in the ground as mouse traps and of other traps. Among the poisons used were phosphor lozenges and grain poisoned with strychnine or with arsenic. As regards their infection by means of bacteria diseases, experiments

were only made with the cultivation of the germs of Loeffler, Lazare and Merezhkovski, the last named giving the best results, while the cultivation of Loeffler and Lazare were found to be unsatisfactory because the first gives a large percentage of immunities and the second is fraught with danger to sheep. The mice eventually perished from epidemics which had sprung up among them, to which they are very liable, and they were partly destroyed by various animals of prey.

The secretary of the rural administration of the government of Cherson writes as follows:

(1) It was particularly noticed that field mice had multiplied and that the number of house mice had largely increased.

(2) The warm winter had without doubt favored their propagation, but probably the main cause consisted in the large quantity of cereals which had remained all over the province, in the shape of thrashed grain as well as in stacks.

(3) It is also certain that the mice increased on the spot, but, according to the observations of some landowners, the mice were noticed to move from east to west. This gives reason to believe that they immigrated from neighboring provinces and occupied the territory of the entire province.

(4) The reports regarding the extraordinary increase of the mice from the spring of 1894, but its commencement dates back to the autumn of 1893. Of late, the mice perish from some disease which is not defined as yet, but to determine its nature certain measures have been taken by the Department of Agriculture. It is not possible to estimate the extent of damage caused by mice; all the more so, because they are accompanied by rats, which not only devour grain and other produce, but even destroy village buildings.

(5) Up to the present, the population have used various domestic remedies for the extermination of the mice, besides which, with the assistance of the rural administration, it was determined to poison the mice with Professor Loeffler's cultivations of *Typhus murium*, as prepared by the Odessa bacteriological station and the Cherson bacteriological laboratory. This cultivation of *Typhus murium* shows its effect upon the numbers of mice not sooner than three to four weeks after its use. In June, 1894, the Department of Agriculture sent to the Province of Cherson, Dr. Merezhkovski, the assistant of the manager of the bacteriological laboratory of the department, to carry out experiments of exterminating the

mice by means of the cultivation of the bacillus discovered by him. The experiments carried out by him in the agricultural school of the Cherson rural administration gave good results, and in October, they were extended to the estate of G. L. Skadovski, a land owner, where they were superintended by a special committee; on the sixth day, the mice began to perish of the cultivation of Dr. Merezhkovski, and on the ninth day, this attained considerable dimensions and the mice were reduced to their normal number. In April, 1895, the department sent out bouillon with the cultivation of Dr. Merezhkovski, but there are no reports as yet to hand concerning the results.

From the Slavenoserbsk district, in the government of Ekaterinoslav, the following information was received:

The mice, which appeared at the end of 1892, were of three species—the usual small house mice, the rather large field mice, and a heretofore not noticed variety having quite sharp noses. The cause of the appearance is not known. The mice increased on the spot and also came from neighboring places. They remained long on the spot, and they also shifted to other places; they ate up large quantities of grain in stacks, thrashed grain, and also flour; they gnawed up straw and bags, and did much damage to the winter and spring crops. No special measures were taken to destroy these mice beyond using traps and mineral poisons. They continued with us during the years 1893 and 1894, disappearing in the spring of 1895, apparently perishing from some peculiar disease, which was no doubt aggravated by the winter having been very cold and without snow. During the latter part of the year 1894, many cats died after eating a number of these mice. It was noticed particularly that cats died very soon after eating a mouse of the variety with pointed noses.

From the Pavlograd district, in the government of Ekaterinoslav, under date of August 16, 1895, the following was received:

The mice, which had multiplied during the two preceding years, were the usual field mice which had migrated into the Pavlograd district from the adjoining districts of the provinces of Poltava and Kharkov. These mice continued to increase in large numbers during the years 1893 and 1894. The damage caused to the fields by them was not very great, but grain in stacks and in warehouses suffered severely. The administration took no measures against the mice, but the population destroyed them as far as was possible by means of traps and poisons. In view of the very rapid

increase, those measures did not perceptibly affect their numbers. The cause which led to the eventual destruction of the mice is unknown.

An interesting communication from the secretary of the rural administration of the Province of Taurida (Crimea) gives the following information:

(1) These varieties of mice appeared in large quantities within the limits of the Province of Taurida—on the fields and the steppe, the common field mouse (*Arricola arvalis*); in the gardens, tree plantations, and straw stacks near the habitations of man, the wood mouse (*Mus sylvaticus*); within the houses, cellars, stores, pens, etc., the gray rat (*Mus decumanus*) and the house mouse (*Mus musculus*). All these varieties are natives of the local fauna.

(2) The common cause which called forth the multiplication in masses of these mice over an enormous extent of territory in Russia, probably lies in the periodical repetition, at certain intervals of time, of one and the same conditions in nature; in particular, the multiplication of the mice was favored by the warm autumns and winters of the years 1893 and 1894, the extermination of birds of prey and of the smaller carnivorous animals; also, the grain left a long time in fields gave abundant food to the mice.

(3) In the Province of Taurida, migrations of mice were only observed over small areas, while in Siberia, bodies of field mice were moving along over large areas, and along their road they ate up all grass vegetation. According to the information collected by the naturalist attached to the administration of this province, the territory infected with the mice is very large; the northern limit of the territory, on which the mice appeared in large numbers, for instance, extends from the town of Keltse, over Sedlets, Chernigov, Vitebsk, Smolensk, Kazan, over the Province of Perm and passes far away into Siberia.

(4) The invasion by mice has already lasted two years, being particularly felt during the autumn months. The extent of damage caused by them is difficult to calculate, but instances of destruction of winter crops and of grain placed in stacks are by no means rare.

(5) In the fight against the mice, the latest methods of inoculating the bacilli of Professor Loeffler and Dr. Merezhkovski were employed. Those means produce among the mice infectious diseases. The inoculations were attempted only on a limited area, and, in the cases where the bacilli of Merezhkovski were employed, gave satisfactory results.

in general, the condition of the eyes was better at the end of the four years than at the beginning. A few cases of myopia existed, but the increase of the difficulty during these four years was less than is ordinarily the case with boys of the same age.

In regard to the heating of schoolhouses, it ought to be laid down as a principle, and agreed to by every educator, that no system should be employed which does not furnish the heat by indirect radiation. Whether from furnaces, steam pipes, or hot water pipes, fresh air should be heated and sent into the schoolroom in sufficient quantities to answer the demands both of heating and ventilation. It must, of course, be borne in mind, that, if fresh air is introduced into the schoolroom, there must be ventiducts sufficiently large to carry off the vitiated air. The overheating of schoolrooms is altogether too common, and frequently is the fault of the teacher. Ordinarily the temperature of the schoolroom should be kept not over 68 degrees.

The proper seating of the schoolroom is to-day certainly a matter of great importance. Perhaps it should not be regarded as of greater consequence than lighting, heating and ventilation; but possibly just here the educators of America and the people at large are more backward and less successful in the discharge of the duty they owe to the rising generation than in all other matters relating to school hygiene.

We have discarded the long desks and long plank seats behind them, and have adopted the single desk and seat. Within a few years attention has been turned, both in America and Europe, to the production of adjustable desks and seats. This is a great gain. The adjustability, however, as yet has proceeded only so far as the height of the seat and the height of the desks are concerned. Adjustable desks and seats ought to be provided everywhere. It may not be economy to displace all existing desks and seats and replace them with those which are adjustable, but at least a few of them might forthwith be placed in every schoolroom. The adjustable seat and desk is an important invention, and the manufacturers are entitled to great credit for producing them and urging upon the community their adoption.

A very important point is the distance between the back of the chair and the edge of the desk. Throughout the whole country, with but few exceptions, this distance is too great. The average child of five or six years requires a space between the back of the chair and the desk of seven to eight inches. In order to have free-

dom of movement, this space, for the youngest children in school, should be nine inches. Many a primary schoolroom in various parts of the country will show this distance to be twelve inches and over, and in not a few instances even as great as sixteen inches. In academies and high schools the largest distance ordinarily required between the back of the chair and the edge of the desk should not exceed thirteen inches. The true scale, therefore, from the primary school to the high school would range only from nine to thirteen inches. Think of a little child, whose body from front to back measures but eight inches, sitting upon a seat with twelve or fourteen or sixteen inches' space between the desk and the chair back! How shall the child sit? If he is to sit back in the chair, as he ought to sit, he will be too far away from the desk for study or writing. If he brings his body into a proper position for using the desk, either in writing or as a rest for his book, he must sit upon the mere front edge of his seat. Moreover, what temptations this condition of things offers for sliding the body downwards under the desk, and sitting with his shoulders only against the chair back.

The preceding discussion by no means covers the whole ground of school hygiene, but is designed merely to call the attention of this council to several important defects in the present working of our school system, and to suggest concerted action along a few lines only, looking towards a remedy for existing evils. Your committee would therefore beg to make the following suggestions:

It is high time that the authorities in the large cities should inaugurate a system of expert examinations with reference to the hygienic and sanitary conditions of their city schools.

We would respectfully represent to the several state departments of public instruction, that, in our judgment, such departments can render no better service than by causing to be made, by a competent commission, wisely appointed, an exhaustive report upon school hygiene, to be widely circulated, and giving to the community information universally needed. Such a report should be the result of the most careful study and inquiry into the various questions constantly arising concerning good sanitation and hygiene; and it should give due attention to the wants of both country and city schools—large schoolhouses in towns and one-room buildings in rural districts.

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into the same stream, or a branch of it called Piper's Brook, which flows through a rich agricultural district and is made very offensive by the pollution.

The riparian owners in the intervening agricultural towns, however, are assisting Hartford by suing New Britain for damages. Eventually New Britain will be compelled to withhold its sewage from the stream, to the advantage of the people of Hartford and of the complaining farmers, and will be forced to take care of its own refuse by some process that will not offend or injure the residents of adjoining towns.

It is noteworthy that a corporation, as in this case, having intelligence and enterprise enough to provide a good water supply and sewerage system for its own community, should be so utterly soulless with regard to its neighbors. For it is to be remarked that while both Hartford and New Britain are sufficiently careful of their own health as not to take their drinking water from the streams which they have polluted, they wilfully offer it to their neighbors! Such criminality, for so it should be regarded, is disgracefully common to other places.

Paterson, N. J., which we have recently taken occasion to animadvert upon, and Troy and other cities above Albany, the capital of New York, where, as in the New Jersey cities, on the river below Paterson, where hundreds of people are poisoned annually, are glaring examples.

With such examples on the part of city and town corporations, it can hardly be a matter of surprise that water companies who contract to supply cities with pure water are commonly purblind to its pollution with sewage, or stable drainage, and then, when overtaken by the murderous consequence of their carelessness, deny their responsibility; or that factory corporations generally, are alike careless of the health and lives of people whose drinking water they habitually pollute. Of the former, the water supply companies of Elmira, N. Y., and of Duluth, Minn., are recent examples, exposed in these pages. According to recent reports, action has been taken by the city authorities of Duluth to annul the charter of the water company for having poisoned several thousand people. The ground on which the application is made is that the company failed to comply with the requirements of its charter in that it did not supply good and wholesome water to the city; and charges the company with wilfully placing its intake pipe close to the sewage discharge from the city of Duluth, so that

it received the sewage and surface waters of Lake Superior, and that as a result of the use of the water by the residents of Duluth several epidemics of typhoid fever raged in the city and hundreds of people died. Since the last bad typhoid epidemic (see SANITARIAN, preceding vol., p. 171) the city of Duluth has been making attempts to own its water plant. It intends to put in an entirely new plant, for which purpose it has endeavored to float new city bonds, being willing to freeze out the old water company and run things itself. The water company, however, is contesting the city's effort at every step, so profitable has been its franchise. The city's action should be amended by a charge of manslaughter. A contest is also going on between the city authorities of Elmira and the water company. The contention of the authorities appears to have been delegated to the Board of Health, which has well nigh exhausted its powers, short of absolutely prohibiting the use of the water, while the company has made no forward movement for the purification of its supply of "pure water" to the city. The Board of Health can present the company to the Grand Jury for indictment; it can request the Attorney-General to move toward annulling the charter of the company, etc., etc., proceedings which would extend over many months of time. It declares the supply of water to be impure and unfit for domestic uses, and imposes penalties looking for the introduction of a filtering plant, which may be introduced before cold weather comes.

For some reason wholly inexplicable, other than carelessness of the health of the people, our authorities generally are habitually tolerant of the pollution of even their own water supplies by private corporations,manufacturing companies, tanneries, etc., and not infrequently they tacitly, at least, co-operate with such corporations against what they call the needless reports and interferences of sanitary officers. For example:

The Board of Health of Philadelphia has been for many years continually exposing the results of the factory and farm yard pollution of the Schuylkill River, the source of the city's water supply. But only just now, as it were, since the Board's last annual report of the number of deaths attributable to drinking water thus polluted. July 15th, "the Supreme Court assumed original jurisdiction and granted the city leave to file the bill in equity against the Reading Coal and Iron Company and others, to restain them from polluting the waters of the Schuylkill by dumping the wash mine matter in such places where it could be washed into the

Schuylkill or its branches." Manufacturers or others, who, purblind to everything that stands in the way of their money-getting pursuits, poison the drinking water of the people, are more dangerous to the community that tolerates them, than would be the tolerance of bolder highwaymen lurking in the precincts who would extort money from those whom they might meet at the points of daggers.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

ALABAMA.—*Mobile*, 31,076: J. A. Abrahams, M. D., Health Officer, reports for June: Deaths, 84—26 under five years of age. Annual death rate, 26.6.

Selma, 7,622. John A. McKinnon, M. D., Registrar, reports for June: Deaths, 14. Death rate, 22.0.

CALIFORNIA.—J. H. Davidson, M. D., President, Los Angeles; J. R. Laine, M. D., Secretary, Sacramento. The Secretary reports for June: Returns from 57 cities, towns, villages and sanitary districts, aggregating a population of 734,314, show a mortality of 938—annual death rate per 1,000, 15.24.

There were 134 deaths from consumption, 79 from pneumonia, 26 from bronchitis, 6 from congestion of the lungs, 7 from diphtheria (and croup), 20 from typhoid fever, 6 from cerebro-spinal fever, 39 from cancer, 95 from heart diseases.

San Francisco, 330,000; Reports for June: Deaths, 500—112 under five years of age. From consumption, 66, acute pulmonary diseases, 73; from zymotic diseases, 48—10 from typhoid fever. Annual death rate, 18.12.

Los Angeles, 100,000; Reports for June: Deaths, 1,116—33 under five years of age. From consumption, 18; acute pulmonary diseases, 4; from zymotic diseases, 18. Annual death rate, 13.92.

Oakland.—Board of Health was reorganized June 19th, and honored itself by the election of Dr. Sarah Shuey, heretofore one of its most active and efficient members, president of the Board. She acknowledged the honor in a graceful speech. Certain public nuisances were declared at the same meeting, and a resolution adopted urging the City Council to take proper action to have them abated.

COLORADO.—*Denver*, 150,000: William P. Munn, M. D., Health Commissioner, reports for June: Deaths, 116. From phthisis, 19—12 contracted elsewhere. Annual death rate, 9.28.

CONNECTICUT.—Professor William H. Brewer, Ph. D., New Haven, President; Professor C. A. Lindsley, M. D., Secretary,

New Haven.—The Secretary's bulletin for June comprises reports from 165 towns in the State, with an aggregate population of 850,300, from which the number of deaths reported for the month was 1,099. The death rate for the larger towns is 16.5; for the smaller, 12.6, and for the whole State, 15.5. Deaths from zymotic diseases, 240—21.8 per cent. of the total mortality—chiefly from measles 47, and diphtheria, 29.

DELAWARE.—E. W. Cooper, M. D., President, Camden; E. B. Frazer, Secretary, Wilmington.

Wilmington, 72,500; W. C. R. Colquhoun, Secretary. Report for the year ending December 31, 1895: The number of deaths was 1,198—483 under five years of age. Death-rate, 16.52 per 1,000. Zymotic diseases caused 173 deaths—27 from typhoid fever. Consumption caused 109, and acute respiratory diseases, 125.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M. D., State Health Officer, Jacksonville.

Pensacola, 15,000; Report for June: Deaths, 24—5 under five years of age. Death rate, 19.2. *Small-pox* continues to be at latest report, July 2d, an exciting subject. It is evident that the negro population is shunning the pest-house, and will use deceptive feasures to conceal the presence of the disease among them. The health officer reported June 28th that on further examination of the neighborhood of a fatal case a few days before, he found a negro boy convalescent from it, whose case had not been reported. Since the discovery of this state of affairs, there has been much comment among citizens, of a very unfavorable character, upon the manner in which health affairs are being conducted.

ILLINOIS.—William E. Quine, M. D., President, Chicago; J. W. Scott, Secretary, Springfield.

State Board of Health met July 7, in the Unity building. It passed a resolution allowing midwives to practice in the city of Chicago under certain restrictions; declined to act on the appeal of the Illinois Medical College asking the board to rescind its order placing the college on the non-recognizable list for one year. The admitting of midwives to practice was the most important business transacted. Applicants will have to submit to a thorough examination and give satisfactory proof that they are capable of doing their duty and file a bond with the board. Dr. Julius Grinker and Dr. H. A. Norden appeared before the board and requested that the diplomas of the Harvey Medical College be not recognized. They charge that the college at present does not fulfill the requirements demanded by the board and ask for an investigation. The

matter was referred to the committee on the administration of the medical-practice act. Dr. Scott, secretary of the board, during the last month has received hundreds of letters from persons in different parts of the country complaining that they had paid J. A. Armstrong, of the Illinois Health University of Chicago, money for diplomas to practice medicine. They found that the diplomas were valueless, as they would not be recognized by any State Board of Health. Dr. Scott said: "The school is a chartered concern, and under the law any person can start a school of the kind. We have no power to suppress it. We answer all the letters by saying that the institution is a fraud."

Chicago, 1,600,000: William R. Kerr, Commissioner, reports for June: Deaths, 1895—858 under five years of age. Death rate for the month, 1.17; for the year ending June 30, 14.83. Prevailing causes of death and the numbers: From diphtheria, 50; typhoid fever, 44; consumption, 190; pneumonia, 111; bronchitis, 66; whooping cough, 17.

Typhoid fever is reported, July 10, to be again on the increase. The five days of this week have shown an average mortality from this cause of three. This is an alarming increase from the rate at the beginning of the month, which did not exceed one death daily, and is the highest average reached since the 20th of last February, immediately following a period when the water supply in certain parts of the city was polluted to an unusual extent. No particular locality seems to suffer in excess of others, but the disease is gaining a general hold on the city.

INDIANA.—Douglass C. Ramsey, M. D., President, Mount Vernon; J. N. Hurty, M. D., Secretary, Indianapolis.

Indianapolis, July 8: The water company having requested the Board of Health of the city to suggest a plan for improving the potability of the water supply, which is taken from a storage gallery in White River and subject to contamination at times, the Board of Health has recommended that intermittent sand filtration be introduced. A rate of 2,500,000 gallons per acre daily is recommended. This recommendation has been adopted.

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

Keokuk, 15,000: P. Davis, M. D., Health Officer, reports that during the fiscal year ending March 31st, 1896, there has not been a *case* of diphtheria reported to the Board of Health for quarantine, and, of course, no deaths from that cause.

Davenport, 31,484: A W. Cantwell, M. D., Physician; Report for the year ending March 1, 1896: Number of deaths, 438—101

under five years of age. Death-rate per 1,000, 13.9. Zymotic diseases caused 108 deaths, and consumption, 51.

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. F. Patton, M. D., Secretary, New Orleans.

New Orleans, 295,000—80,000 colored: Deaths in June, 641—colored 250—249 under five years of age—87 colored. Deaths from consumption, 61; pneumonia, 17; bronchitis, 10.—*Small-pox*, 11—10 colored; cholera infantum, 53; enteritis, 44. Death rates: Whites, 24.06; colored, 37.50: 27.97.

Quarantine.—There is a bill before the Legislature providing for an appropriation of $45,000 for the maintenance of the quarantine system and for the abolition of fees heretofore exacted of vessels coming to this port—all in the interest of a free port. The Legislature would make a good name for itself by voting the amount asked for to enable the Board of Health to abolish quarantine fees. It is to be hoped it will not fail to do so.

MARYLAND.—John Morris, M. D., President, Baltimore; James A. Steuart, M. D., Secretary, Baltimore.

Baltimore, 496,315—73,747 colored. James F. McShane, M. D., Health Commissioner, reports for June: Deaths, 647; 467 white persons, and 180 colored. Death rates: Whites, 13.24; colored, 29.19: 16.56. 249 were of children under five years of age. Deaths from consumption, 76; pneumonia, 37; cholera infantum, 26; diphtheria, 19; typhoid fever, 13; infectious diseases, 42.

MASSACHUSETTS.—H. P. Walcott, M. D., Chairman, Cambridge; S. W. Abbott, M. D., Secretary, Boston.

Boston, 501,083; S. H. Durgin, M. D., Chairman. Deaths in May, 967—286 under five years of age. Annual death rate, 23.15 per 1,000. From diphtheria (and croup), 48; scarlatina, 10; consumption, 119. Cases of contagious diseases reported for the month: Diphtheria, 346; measles, 419; scarlatina, 77; typhoid fever, 35.

Haverhill, July 10: *Typhoid fever* has been increasingly prevalent in this city since June 1, more than forty cases having been reported. Prof. Sedgwick, of the State Board of Health, after a thorough investigation, states that the cause of the disease is in the waters of Crystal lake, which supplies the greater portion of the shoe factories. Two-thirds of all the cases, excluding imported cases and cases of earlier date, were located upon this source of water supply. An inspection of the shores of the lake revealed liabilities, at least, sufficient to account for the probable pollution of the water.

Part of the shore is used for picnic grounds. On another part there is a cottage or club-house, with its sink spout very near the lake, near the intake of the water-works, and evidence of other improper use of the shores. His conclusions are that—"in any case, there can be no doubt that the city of Haverhill should own and control not only the lake, but its entire shores. A lake which supplies drinking water to a modern city should not be used for boating, fishing or swimming, nor its shores for cottages or picnic grounds; and until Crystal lake can be entirely rescued from its present uses by the miscellaneous public, those who drink the water derived from this source would do well to boil and cool it before drinking."

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

The Secretary reports for June: Compared with the preceding month, cholera morbus, dysentery, diarrhoea, cholera infantum, scarlet fever, typhoid fever and whooping cough, increased and influenza, bronchitis and tonsillitis decreased in area of prevalence.

Compared with the average for June in the ten years, 1886-1895, pleuritis was more prevalent and diphtheria, consumption, intermittent fever, remittent fever, erysipelas, pneumonia, influenza, bronchitis, inflammation of kidney, rheumatism and inflammation of bowels were less prevalent.

Including reports by regular observers and others, *consumption* was reported present in Michigan in the month of June, 1896, at 208 places; *measles* at 78 places; *scarlet fever* at 49 places; *typhoid fever* at 43 places, and *whooping cough* at 36 places.

Reports from all sources show *consumption* reported at 2 places more; *measles* at 13 places more; *scarlet fever* at 3 places less; *typhoid fever* at 9 places more, and *whooping-cough* at 9 places more in the month of June, 1896, than in the preceding month.

MINNESOTA.—Franklin Staples, M. D., President, Winona; C. N. Hewitt, M. D., Secretary, Red Wing.

St. Paul, 140,292: Alexander J. Stone, M. D., Commissioner, reports for June: Deaths, 120—44 under five years of age. Annual death rate per 1,000 was 10.26. Deaths from diphtheria (and croup), 2; typhoid fever, 1; consumption, 26.

MISSOURI.—F. J. Lutz, M. D., President, St. Louis; Willis P. King, M. D., Secretary, St. Louis.

The State Board appears to be taking energetic action against the quacks with which the State is infested. Last winter the State

Board took the stand that all colleges must file a list of their students with the Board. The determination is to raise the standard of the colleges throughout the State, even at the expense of closing a number of them which do not meet the requirements. A fee for the examination of diplomas will be charged by the State superintendent and he will be given as many assistants as needed to help in the work. This rule will become effective next fall.

At a meeting of the Board in Kansas City, July 7th, Secretary King said regarding the Board's action: "When a license to practice medicine is granted in this State hereafter, the recipient will be a man of education and refinement, and no stable hands or car drivers will write 'M. D.' after their names. Fellows who get a diploma from a school taught by Bill Jones and his wife down in Bear Creek can not become physicians, unless the superintendent of schools decides they have acquired more than the rudiments of education. We may freeze out some of these inferior colleges or reduce the number of graduates, but it will be a good thing, and the death rate will be lower."

St. Louis, 570,000—31,000 colored: M. C. Starkloff, M. D., Commissioner of Health, reports for June: Deaths, 1,127—119 under five years of age. From diphtheria (and croup), 19; phthisis, 84; typhoid fever, 6; pneumonia, 38; bronchitis, 18. Annual death rate per 1,000, 23.72.

NEBRASKA.—J. V. Beghtol, M. D., President, Friend; F. D. Haldeman, M. D., Secretary, Ord.

Omaha, 140,452: S. R. Towne, M. D., Commissioner of Health. Report for May, 1896: Deaths, 59—19 under five years of age. Annual death rate, 5.0. Communicable diseases reported: diphtheria, 2; scarlet fever, 10.

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

Hudson County—Jersey City and vicinity, 338,671: Report for June: Deaths, 510—296 under five years of age; from diphtheria (and croup), 44; typhoid fever, 7; total from zymotic diseases, 117; from consumption, 36; pneumonia, 45. Annual death rate, 21.7.

"Plenty of Pure Water for All," is the recent newspaper announcement, apparently at the instance of the East Jersey Water Company, who, on July 2d, submitted to the Jersey City Street and Water Board its first bill under the contract. The claim is for water delivered from Jan. 10 to June 27. The total amount delivered during that time was 2,249,900,000 gallons. The company is extending a new main to Belleville, and the result will be an in-

creased supply. The company on June 8 offered to reinforce the supply by adding the small additional quantity needed from the upper Passaic at Little Falls, thus doing away entirely with the pumping at Belleville, but the city has taken no action on the company's offer.

The Passaic Pollution Commission, composed of Dr. H. C. Herold, Dr. W. H. Hunt, and E. J. Marsh, met in Jersey City, July 15th, to hear what the authorities had to say in relation to the Passaic River and the means that may be taken to prevent the contamination of its waters. Not much light was thrown upon that matter, however, the hearing being mainly devoted to a consideration of Jersey City's water supply.

Mr. C. C. Vermeule, consulting engineer, read a report teeming with statistics regarding the watershed of the Passaic River and the supply. He said the sewage in the Passaic has been increasing at the rate of 40 per cent. each ten years. Below Little Falls the area drained is 176 square miles. The daily yield of the area is 120,000,000 gallons. At present the amount of sewage in this water is equal to one-third its volume. The proportion will be less when the volume of water is greater, but that, he said, is a fairly exact statement of the condition of the water during the Summer months. By the year 1900, at the present rate of increase, Mr. Vermeule said, the volume of sewage would be nearly one-half, and by 1920 it would be fully two-thirds.

Sand Filtration Proposed.—Mr. Allen Hazen urges a plan of double filtration of the water supply for Jersey City; the water to be drawn from the Passaic River, and is much contaminated with sewage. Mr. Hazen proposes, in the first place, to filter the water at a slow rate, through large sand filters, on which all sediment will be deposited, and a high degree of purification attained. As an additional precaution, the filtrate is then to be sent through a set of filter beds of about one-third the area of the above before being allowed to enter the supply mains. These latter filters, being of comparatively small extent, are to be protected by vaulting, and thus their action is not likely to be affected by frost.

Newark, 215,725: Health Officer Chandler reports for the two weeks ending June 27: Deaths, 166—65 under five years of age; from diphtheria, 2; consumption, 18; pneumonia, 8. Annual death rate, 19.97.

Paterson, 102,616: J. L. Leal, M. D., Health Officer, reports for June: Deaths, 138—65 under five years of age; from diphtheria (and croup), 10; consumption, 11; pneumonia, 3.

NEW YORK.—Daniel Lewis, M. D., President, New York; B. T. Smelzer, M. D., Secretary, Albany.

The Secretary's *Bulletin* for May reports 9,541 deaths, or nearly 1,000 less than the month preceding, a daily average of 308 against 350 in April and 358 in March. The actual mortality is almost identical with that of May, 1895, as is also the decrease from the month preceding, the average diminution in the number of deaths from April to May during the past ten years being about 800. The death rate was 17.50 against 19.30 in April, which is the average rate for the four preceding months of the year. The *Zymotic mortality* was very nearly the same as that of April, the deaths from *Diphtheria* and *Diarrhoeal* diseases being somewhat more and from *Measles* a little less. Compared with May, 1895, the zymotic mortality was also nearly the same; from *Scarlet Fever* and diphtheria there were fewer than the average number of deaths in May, while from measles and diarrhoeal diseases the mortality is above the average. Measles shows a material decrease chiefly in the Maritime district, but it has generally diminished in prevalence everywhere. The increase in Diphtheria is confined to the Maritime district; thirty-five towns report its prevalence against thirty in April. Twelve per cent of the mortality of the month was due to zymotic diseases, the average for May being 13.6 per cent. Consumption caused the same number of deaths as in April, 1,190; it customarily has a larger mortality during the winter and spring months than during the rest of the year; 12.5 per cent. of the deaths were from this cause. There was a decrease from April of 650 in the mortality from *acute Respiratory* diseases, which is customary; the highest relative mortality from this cause was in the Maritime district. There was one death from small-pox in New York, and a case has been reported from North Hempstead. The mean barometer for the month was 30.00, the average relative humidity being 68 per cent. and the dew point 50°. There was a deficiency of one inch in the rainfall, and the average mean temperature was 61°, which is excessive by 4°. The winds were generally southerly and westerly.

The new law to protect the health of women and children employed in mercantile establishments, passed April 23d, 1896, that will go into effect Sept. 1st, proximo, requires that—"No male under sixteen years of age, and no female under twenty-one years of age, employed in any mercantile establishment of this state, shall be required, permitted or suffered to work therein more than sixty hours in any one week; nor more than ten hours in any one day,

unless for the purpose of making a shorter work day on any one day of the week; and in no case shall any male under sixteen years of age, nor any female under twenty-one years of age, work in any mercantile establishment after ten o'clock in the evening or before seven o'clock in the morning of any day. * * *

"No child under fourteen years of age shall be employed in any mercantile establishment in this state. * * * and it shall be unlawful for any proprietor, agent, foreman, or other person in or connected with a mercantile establishment, to hire or employ any child under the age of sixteen years to work therein without there is first provided and placed on file in the office thereof a certificate * * * by the board or department of health or health commissioner or commissioners of any city or town or incorporated village where such child is employed. * * * Which said certificate shall state * * * that the health commissioner or commissioners or the executive officer or officers of the board, or department of health, or any person or persons designated by him or them, as hereinafter provided, is satisfied that such child is physically able to perform the work which it intends to do, and * * *

"The words 'mercantile establishment' wherever used in this act shall be construed to mean any place where goods, wares, or merchandise are offered for sale.

"A suitable and proper washroom and water closets shall be provided in each mercantile establishment in which women and children are employed, or in an adjacent building to or connecting with tht building in which such mercantile establishment so having women and children employed therein is situated, and so located and arranged as to be easily accessible to the employes of such establishment, and such water-closets shall be properly screened and ventilated, and kept at all times in a clean condition, and the water-closets assigned to the women and girls employed in such establishment shall be wholly separate and apart from those assigned to men. Wherever a lunch room is provided in any retail mercantile establishment where females are employed, such place shall not be next to or adjoining any water-closet or water-closets, unless permission is first obtained from the board or department of health, or health commissioner or commissioners of the city or town where such mercantile establishment is situated, which permission shall be granted by such board or department of health, or health commissioners unless such board or department of health or health commissioner or commissioners are satisfied that proper sanitary conditions do not exist, and such permission shall be revoked at any time when such board or department of health or health commissioner or commissioners are satisfied that such lunch room or lunch place is kept in a manner or in a part or parts of the building injurious to the health of the persons using the same.

"It shall be the duty of all employers of females in any mercantile establishment to provide and maintain chairs or stools or other suitable seats for the use of such female employes to the number

of one seat for every three females employed, and to permit the use of such seats by such employes, at reasonable times, to such an extent as may be requisite for the preservation of their health. And such employes shall be permitted to use same as above set forth in front of the counter, table, desk or any fixture, when the female employe for the use of whom said seat shall be kept and maintained is principally engaged in front of said counter, table, desk or fixture; and behind such counter, table, desk or fixture, when the female employe for the use of whom said seat shall be kept and maintained is principally engaged behind said counter, table, desk or fixtures.

"No women or children shall be employed in the basement of any mercantile establishment unless permission is obtained by the proprietor of the establishment from the board or department of health or health commissioner or commissioners in the city or town in which said mercantile establishment is situated, allowing the employment of women and children in such basement. The board or department of health or health commissioner or commissioners shall not grant such permission unless they are satisfied that such basement is sufficiently lighted and ventilated and is in all respects in the sanitary condition which is necessary for the health of those employed.

"Not less than forty-five minutes shall be allowed for the noonday meal in any mercantile establishment in this state.

"It shall be the duty of the board or department of health or health commissioner or commissioners of the cities and towns in the state to cause this act to be enforced, and whenever any of the provisions of this act are violated to cause all violators thereof to be prosecuted, and for that purpose, the health commissioner or commissioners and the officers or officer of the board of health of every city or town in the state, or the inspectors thereof, or any other persons designated by such board of health or health commissioners, are authorized and empowered to visit and inspect at all reasonable hours and as often as shall be practicable and necessary all mercantile establishments in the city or town in which the office of said board or department of health or health commissioner or commissioners is situated. It shall be unlawful for any person to interfere with or obstruct or injure by force or otherwise any employe of any board or department of health of any health commissioner or commissioners appointed to enforce the provisions of this act, while in the performance of his or her duties, or to refuse to properly answer questions asked by such officer or employes in reference to any of the provisions of this act.

"Proceedings under this act must be begun within thirty days after the commission of the alleged offense.

"Any person who violates or omits to comply with any of the foregoing provisions of this act, or who suffers or permits any child to be employed in violation of its provisions, shall be guilty of a misdemeanor, and on conviction shall be punished by a fine

of not less than twenty dollars, nor more than one hundred dollars for a first offense, and not less than forty dollars nor more than two hundred dollars, or by imprisonment of not more than sixty days for a second offense, and for a third offense by a fine of not less than two hundred dollars nor more than three hundred dollars, or by imprisonment of not more than ninety days, or by both such fine and imprisonment."

New York City, 1,995,000: Reports for the month of May: Deaths, 3,454—1,334 under five years. Death rate, 22.23. Zymotic diseases per 1,000 from all causes, 154.75; diphtheria (and croup), 192; typhoid fever, 10; consumption, 495; acute respiratory diseases, 647.

The destruction of the rookeries still goes on. July 15 the Board of Health ordered the evacuation and destruction of 42 more in addition to the 15 condemned May 27, as unfit for habitation. But for the existence of such pest holes the rate of mortality of this city would be among the lowest of the large cities in the world. All large cities have their mudsills, which swell their death rates, and New York's have been her foul dens, called tenement houses. The health officers of our southern cities in particular insist upon a constant discrimination of the death rates of the races to show how much more healthful their cities are for white people than the northern cities—exclusive of colored people. San Francisco excepts her China town, and Denver her visitors. But if any of them have, or ever have had so many or so foul disease culture beds in their midst, or so many investors in such culture beds who live on the residue of the proceeds—the short lived tenants—as are and have been for many years common to New York, they have never published the disgraceful particulars. The average death rate per 1,000 occupants of the 42 just condemned for the last five years has been 40.8. It ranges from 23.42 to 75.05.

Brooklyn, 1,100,000: For May, deaths, 1,694—582 under five years. Death rate, 18.00. From zymotic diseases per 1,000 from all causes, 132.50; diphtheria (and croup), 119; typhoid fever, 6; consumption, 170; acute respiratory diseases, 291.

Coney Island has at last fallen under the search light of sanitary inspection, and there is reason to hope that it will ere long be a fit place for decent people to visit. There is no drainage worthy of the name. Most of the walks in the Bowery area are of wood and are elevated, and it has become a not uncommon practice for the denizens to dispose of their garbage by lifting a plank in the walk and throwing garbage beneath. This is done in the night time

and stealthily, and it is very hard to find the transgressors. The population of Coney Island varies in a day from 10,000 to 100,000, and the offput of waste garbage and sewage involved in the entertainment and feeding of that number of people in so limited an area is enormous and requires immediate handling in order to avoid offense.

The Brooklyn Health Department doubtless fully recognizes its responsibility and realizes the difficulty of properly contending with this recent addition to its sphere and duty; and more for the reason that it is handicapped by stinted appropriations. For means to carry out the new law to protect the health of women and children engaged in mercantile pursuits (a few pages preceding), the Board of Alderman has thus far ignored the requirements of the Health Commissioner—seemingly to extort the privilege of selecting the employes needed for the purpose.

"*Bushwick Creek*," a disgusting sewage-mud flat, known by that name, in the midst of a populous district, is being urged upon the attention of the Health Department by reason of its sickening odors. The readers of THE SANITARIAN have been made familiar with this disgraceful place to both City Works and Health Department by pictures of it two years ago, showing its admirable receptive adaptations to cholera—or any other disease germs. It still abides the opportunity, while continuously promotive of sickness of every kind among those who dwell in its vicinity. The creek that once existed there has been entirely obliterated by its having been made a dumping place for city dirt. Meanwhile three sewers constructed more than a dozen years, with an outfall into the creek, when it *was* a creek, have continued their outflow into the dirt, and as if this were not enough to attract the attention of the health authorities, into a quantity of lumber "on sale" grounded on this sewage flat formed at the mouth of the "creek." And this is considerably nearer to the heart of Brooklyn than Coney Island, and is ten years old.

Buffalo, 335,709: Reports for May: Deaths, 319—89 under five years. Death rate, 11.4. From zymotic diseases per 1000 deaths, from all causes, 84.70; diphtheria (and croup), 8; acute respiratory diseases, 65; consumption, 38.

Unless there is some mistake in the estimate of population or deficiency in returns, which there does not appear to be any reason to suspect, Buffalo is certainly one of the most healthful of

cities of corresponding population. The death rate for the first six months of the current year has been 11.67.

Rochester, 160,000: For May, deaths, 171—35 under five years. Death rate, 12.85. From zymotic diseases, per 1,000 deaths, from all causes, 65; consumption, 23; acute respiratory diseases, 16.

Albany, 100,000: Deaths, 184—48 under five years. Death rate, 22.0. From zymotic diseases, per 1,000 deaths, from all causes, 70.65; typhoid fever, 3.

Syracuse, 100,000: For May, deaths, 130—26 under five years. Death rate, 15.6. From zymotic diseases per 1,000 deaths from all causes, 116.50; consumption, 18; acute lung diseases, 10.

NORTH CAROLINA.—George G. Thomas, M. D., President, Salem; Richard H. Lewis, M. D., Secretary, Raleigh.

June bulletin summarizes the report of 82 counties for May. The mortuary statistics for the month, of an aggregate population of 27 towns, 86,422 white and 61,663 colored: Deaths, respectively, 131 and 146, and death rates 18.2 and 26.8. The chief causes of death were: Consumption, 37; pneumonia, 15; measles, 11; brain diseases, 15; heart disease, 21; diarrheal diseases, 59; from other diseases, 2 to 7. Deaths under five years of age, 105—59 colored.

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus.

At a meeting of the State Board, June 17, the Secretary recommended that all the cows in the State should be subjected to the tuberculin test. Referring to another State in which about 20 per cent. of the milch cows had been found to be consumptives, he said that, while he "could not even make a guess as to the prevalence of the disease among cows in Ohio, he had no reason to believe that less than 20 per cent. were affected." The tests in New York and Massachusetts have shown the percentage infected to be about 16 per cent. In several European countries the percentages are larger. The slaughter house records of Berlin for two years show (for 142,874 oxen and cows) 15 per cent., and similar records for three years in Copenhagen (132,294 oxen and cows slaughtered) disclose nearly 18 per cent. Although such records do not exist in Great Britain, the Royal Commission expressed the opinion last year that if they could be obtained they would show that the herds in that country were in no better condition.

Cincinnati, 350,000: J. W. Prendergast, M. D., Health Officer, reports for June: Deaths, 454—177 under five years of age. Death rate, 15.56 per 1,000. From diphtheria (and croup), 11; typhoid fever, 5; consumption, 60; pneumonia, 25; measles, 6.

Cleveland, 330,279: J. L. Hess, M. D., Health Officer, reports for June: Deaths, 412—184 under five years; from diphtheria (and croup), 6; typhoid fever, 10; consumption, 21; pneumonia, 32. Death rate, 14.69.

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

Philadelphia, 1,188,793: Theodore B. Stulb, Health Officer, reports for four weeks ending June 27: 1,638—645 under five years of age. Deaths from diphtheria (and croup), 73; typhoid fever, 27; consumption, 156; pneumonia, 109.

July 15: "*Filtration* stands to-day (*Call*) side-tracked and substantially unconsidered, thanks to the opposition of men who are supposed to be the servants of the people. They have obstructed and hindered it at every stage. They have assailed its virtues and exaggerated its defects. On every occasion they have sought to belittle its importance.

"Meanwhile typhoid continues. So does the filthy water with its infusions of sewage and other pollutive substances. The report published yesterday with reference to the pollution of the Schuylkill water is but one evidence of the impure conditions of that water. Just how much of disease might be traced to this criminal neglect on the part of councils to provide filtration may be left to scientific estimation. And as for councils—let councils, with their derelicts and blunderers, be left to the wrath of the voters whose views they have misrepresented and whose confidence they have abused."

Pittsburg, 280,000: Report for four weeks ending June 27th: Deaths, 340—140 under five years of age; typhoid fever, 10; consumption, 31. Death rate, 15.76.

Plymouth, July 13: *Typhoid fever* is somewhat alarmingly prevalent here under the recollection of the epidemic eleven years ago, when there were 1,500 cases with 150 deaths in a population of about 9,000. There are reported to be about thirty cases at this time, and there have already been four deaths from it. It seems almost incredible that the infection proceeds from the same house in the hills from which the drinking water was poisoned in 1885. The presence of typhoid in that house was ascertained in April,

when an inspector remarked in his report: "Here is a typhoid-infected house directly on a stream that supplies 10,000 innocent people, and *it was allowed to remain after it had caused an epidemic of at least 1,500 cases and 150 deaths.*"

The pollution of the stream by the inmates of this house has not been prevented simply because the Plymouth Water Company has been unwilling to pay for the property the paltry price which the owners have set upon it! Yet there are supposed to be civil *authorities* as well as sanitary inspectors.

SOUTH CAROLINA.—J. R. Bratton, M. D., Chairman, Yorkville; H. D. Fraser, M. D., Secretary, Charleston.

Charleston, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M. D., Health Officer, reports for four weeks ending June 27th: Deaths, 181—128 colored. Under five years of age, 88. Annual death rates, white, 23.78; colored, 45.84; 36.12.

TENNESSEE.—J. D. Plunkett, M. D., President, Nashville; J. Berrien Lindsley, M. D., Secretary, Nashville.

The Secretary's Bulletin reports: The principal diseases, named in the order of their greater prevalence, in the State, for the month of May were: Dysentery, malarial fever, measles, consumption, typhoid fever, diarrhoea, whooping cough, lung diseases, acute, scarlet fever, rheumatism and mumps.

Memphis, 55,923—white, 28,064; colored, 27,859. J. J. McGowan, M. D., Secretary of the Board of Health, reports for the month of May: Deaths, 125—62 colored. Death rates, white, 26.94; colored, 26.71; 26.82. Contagious diseases reported during the month: Diphtheria, 2; scarlatina, 5.

UTAH.—*Salt Lake City*, 48,076: W. T. Dalby, M. D., Health Commissioner, reports for June: Deaths, 52; death rate, 8.91.

VERMONT.—C. S. Caverly, M. D., President, Rutland; J. H. Hamilton, M. D., Secretary, Ritchford.

Dr. C. S. Caverly, President of the State Board of Health, and Dr. J. H. Hamilton, of Ritchford, the secretary of the Board, met several of the health officers of Rutland County, June 16th, at the Bardwell and organized a County Sanitary Association. Among the health officers present were Dr. W. M. Stearns, of this city; Dr. Ross, of Poultney; Dr. H. L. Manchester, of Pawlet; Dr. A. C. Norton, of Middletown Springs; Dr. C. W. Peck, of Brandon; Dr. H. H. Swift, of Pittsford; Dr. G. A. Roberts, of Castleton; Dr. J. M. Hamilton, of Proctor, and City Engineer Smith.

A temporary organization was effected with these officers: President, Dr. C. W. Peck, of Brandon, and secretary, Dr. J. M. Hamilton, of Proctor, who were appointed a committee to draw up a set of by-laws and report at an early meeting when the temporary organization will be made permanent. Besides the health officers and doctors the laity are invited to join the association. If these county associations meet with success a state organization will be effected in the fall. To-day Dr. Caverly and Dr. Hamilton will go to Bennington and organize an association there.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; U. O. B. Wingate, M. D., Secretary, Milwaukee.

Milwaukee, 255,000: Walter Kempster, M. D., Commissioner of Health, reports for June: Deaths, 257—117 under five years of age. Annual death rate, 12.0. Deaths from diphtheria (and croup), 5; consumption, 21. Cases of diphtheria reported during the month, 39; scarlet fever, 6; typhoid fever, 6; measles, 12.

VITAL STATISTICS OF ENGLAND FOR 1895.

Estimated population of England at the middle of the year 1895	30,394,078
Births	921,860
Birth-rate	30.4 per 1,000
Deaths	568,758
Death-rate	18.7 per 1,000
Marriages	227,865
Persons married	455,730
Marriage-rate	15.0 per 1,000

Of the births, 468,753 were boys, and 453,107 were girls, being in the ratio of 1,035 boys to each 1,000 girls.

Of the deaths, 290,714 were males, and 278,044 were females, giving an estimated death-rate of 19.7 per 1,000 males, and 17.7 per 1,000 for females, which is equivalent to 1,113 deaths of males to each 1,000 deaths of females in equal numbers living.

The marriage rate of London for 1895 was			17.1
The birth-rate	"	"	30.4
The death-rate	"	"	19.4

ARMY SANITATION IN CUBA.

THE SANITARIAN has been favored with a recent report of Sr. Ferdinand de Losada, Inspector of the Department of Health of the army, published by order of the Captain-General. Connected with it is an extensive table giving a statement of the condition of the army from January 1st to the end of April, 1896, and a similar table giving the condition of the army which served from January 1st to April 30th, 1876.

The object of this publication is to popularize in the army in Cuba the general principles of Hygiene, and for that reason technical terms have been avoided as far as possible. It is hoped that a familiarity with the principles here laid down with sufficient detail will contribute to diminish as far as possible the rise and extension in the army under all possible conditions of the service of the diseases peculiar to the climate. It is on the whole an excellent document sufficiently complete for general use and shows the great interest taken by the sanitary authorities in the welfare of service.

The results given in this official report are claimed to be very satisfactory and show that the reports so extensively circulated regarding the health of the army are very much exaggerated.

In 1876 the number of the wounded in the effective force was: In January, 5 in the 1,000; in February, 4; in March, 5; and in April, 4 in the 1,000 men.

In 1896, January, 9 in the 1,000; February, 9.50; March, 11.50, and in April, 10.50 in the 1,000.

The excess in the proportion of the wounded and of deaths from injuries received in action in the first quarter of 1896 is due, as stated, to the greater frequency and importance of the engagements that took place during that period.

Deaths from wounds received in the campaign:

In 1876, in January, 1 in 10,000; February, 9; March, 1 in 10,000, and in April, 6 in 10,000.

In 1896, January, 2 in 10,000; in February, 1.7 in 10,000; in March, 1.7, and in April, 1.5 in 10,000.

Deaths from Yellow Fever:

In 1876, in January, 17.5 in 10,000; in February, 12.5; in March, 12.5, and in April, 7.5 in 10,000.

In 1896, in January, 77.5 in 10,000; in February, 12.5; March, 40, and in April, 35 in 10,000.

The army of 1876 was in much greater proportion acclimated; the present force consists mostly of recruits recently arrived from the Peninsula, and are therefore more liable to take Yellow Fever.

The chart also shows the remarkable decrease in the number of days served in the hospitals during this period of 1896 and the consequent economy resulting to the government.

The manual which accompanies the chart treats of the diseases consequent on the climate under the following heads: "Acclimation and Anemia," Prophylaxis and treatment in Anemia, "Yellow

Fever," Endemic and Epidemic, Etiology, Prophylaxis on the coast and in the interior.

"Dysentery," Etiology, Prophylaxis. Treatment.

"Marsh Fever," Prophylaxis. Treatment.

"Insolation," Asphyxia from heat, Prophylaxis. Treatment of Asphyxia. T. P. C.

NEW BOOKS AND BOOK REVIEWS.

WATER-SUPPLY (considered principally from a sanitary standpoint), by WILLIAM P. MASON, Professor of Chemistry, Rensselaer Polytechnic Institute; Member of American Philosophical Society, American Chemical Society, American Water Works Association, Franklin Institute, etc., etc., 8vo., pp. 510; illustrated. New York, JOHN WILEY & SONS.

A timely and practical work on a subject of the utmost importance to all sanitarians and hydraulic engineers. At no previous time in the progress of sanitary knowledge has the causal relation of impure drinking water to disease been so manifest as it is now. During recent years intelligent people everywhere have been made acquainted with the relation of polluted water to typhoid fever, the most universally prevalent of preventable diseases; and to cholera, which has been an educational force of inestimable value, in illustration of its dependence upon the same cause. But besides these there are other intestinal diseases whose causal relation to impure water is perhaps less generally recognized, though no less certainly known to the best observers, which in the aggregate kill more people than typhoid fever and cholera combined. All these diseases are *preventable*—preventable by the protection and purification of water supplies. *How* to protect and purify water is the object of this book.

The sanitarian, physician, hydraulic engineer, chemist, or of whatever other profession—or of no profession at all—all who would have a clear presentation of the facts culled from what has been published during recent years, on the relation of drinking-water to disease; biological research; analytical methods and the results of analysis; natural and artificial purification of water; the different methods of purification adapted to different conditions, should possess this book. It is alike the most comprehensive and the most lucid work on the relation of the water supply to disease,

and the means of protecting and purifying the water supplies hitherto published.

HEREDITY AND CHRISTIAN PROBLEMS. By AMORY H. BRADFORD, 12mo., pp. 300. Price $1.50. New York: MACMILLAN CO. The *Reverend* author of this book (for such he is) has evidently read pretty much everything that has been published on heredity. And while he presents its irreconcilable teachings, he nevertheless attempts to deduce conclusions with the certainty of a law—"the law through which the individual receives from his parents by birth his chief vital forces and tendencies, his physical and spiritual capital; environment consists of 'all the events and conditions' (*The Jukes*) surrounding him afterwards that modify his nature and change the tendency of his life"—which? The two propositions appear to be irreconcilable—an antagonism of forces.

The author's purpose is a praiseworthy one, but notwithstanding his familiarity with the literature of the subject—and it is this only which he undertakes to handle—"the researches of others are gathered and weighed, not so much for a more exact knowledge of the subjects themselves, as for a clearer understanding of their bearing upon the life of man and the modifications they call for in the theories concerning human duty and responsibility." His effort to reconcile the antagonistic forces, represented by their definition, as above quoted, appears to be impracticable.

"No child is condemned because of the sin of its parents, and though many suffer because of such sins, yet the successive generations are quickly taken in hand by nature, and sooner or later purified from hereditary taint." (p. 52.) "This factor, therefore, the factor of environment, compels the attention of every student of sociology and religion. Indeed, it may be doubted if the part played by it in civilization is not even greater than that played by heredity." (53). "With men in general, where there is no organic defect, heredity is the dominating force." (65). "The Spirit of God is the divine factor in the environment of every human being. If a man chooses he may resist all improving influences; and if he wills to do so, he can conquer all the vicious tendencies inherited from past generations." (228). Nevertheless, the book is so admirably written, and so cleverly adduces the contending theories on heredity, that we take pleasure in commending it to all readers interested in the subject.

CONTEMPORARY LITERATURE.

SANITATION AND SOCIOLOGY.

The duty of the sanitarian is acknowledged to be of greater scope as the years pass and the meaning of sanitary reform is proved not to be restricted to the physical life of man, but to affect all his activities as a human being. The interest of the sanitarian is now said to be in "whatever can cause or help to cause discomfort, pain, sickness, death, vice or crime—and whatever has a tendency to avert, destroy or diminish such causes." We are told that preventable evils, such as loss of life, impairment of health, and physical disability, impose upon the people unnumbered and immeasureable calamities, pecuniary, social, physical, mental, and moral, which ought to be avoided.

The sanitarian is right in regarding his special field of work in relation to the higher activities of mankind. He should require that, in his own mind at least, every principle studied, every reform advocated, every plea made, should be considered in the light of its role as a part of the foundation for the highest and best expression of life, whether it be physical, intellectual, moral or spiritual. (PROFESSOR MARION TALBOT, in *The American Journal of Sociology* for July. University of Chicago Press.)

THE "TREE OF LIFE."—The Guaraunos are to be found all over the delta of the Orinoco. They eat little and wear less. Many authorities claim that they subsist on the *moriche* palm-tree alone. Whether this be true or not, the tree in question is without doubt an indispensable factor in the problem of life. Not only does it furnish a safe elevation for a home, but gives a nutritious sago, or meal, from which bread is made, a tree fifteen years old yielding six hundred pounds of this meal. In addition, the juice furnishes a kind of wine, and out of the fiber is made cord, rope, hammocks, and a rude species of cloth. This tree, owing to the many and various purposes it serves, was called by the early missionaries the "tree of life."—("Glimpses of Venezuela and Guiana," by W. Nephew King, in *The Century* for July.)

NO TWO MEN ALIKE.—The professor who would aim at shaping the character of all his students according to one uniform ideal standard, would be attempting the impossible, because he would be striving to do what is at variance with the laws of nature and of nature's God. In all the Creator's works there is charming variety. There are no two stars in the firmament equal in magnitude

and splendor, "for star differeth from star in glory;" there are no two leaves of the forest alike, no two grains of sand, no two human faces. Neither can there be two men absolutely identical in mental capacity or moral disposition. One may excel in solid judgment, another in tenacity of memory, and a third in brilliancy of imagination. One is naturally grave and solemn, another is gay and vivacious. One is of a phlegmatic, another of a sanguine temperament. One is constitutionally shy, timid and reserved; another is bold and demonstrative. One is taciturn, another has his heart in his mouth. The teacher should take his pupils as God made them, and aid them in bringing out the hidden powers of their soul. If he tries to adopt the leveling process by casting all in the same mould, his pupils will become forced and unnatural in their movements; they will lose heart, their spirit will be broken, their manhood crippled and impaired.—From "THE TEACHER'S DUTY TO THE PUPIL," by HIS EMINENCE, CARDINAL GIBBONS, in *North American Review*, for July.

SPORTING TENDENCIES OF OUR TIME.—There is an open-air movement, almost revolutionary in its degree, and which cannot by any means be accounted for by any theories of a more numerous leisurely class. People are bicycling, yachting, running, jumping, fishing, hunting, playing baseball, tennis and golf, to an extent which is new in this generation. Nor is any considerable fraction of these people of the class whose wealth makes some such diversion inevitable; they are workers in stores and offices of the great cities; typewriters, elevator boys, barbers, physicians, lawyers and clergymen—in short, "the people." If it be true that the times are too strenuous, that Americans are a nation of dyspeptics because they work too hard and take too little physical exercise, the signs of 1896 are very promising of better things.—From "The World's Sporting Impulse," by CHARLES D. LANIER, in *Review of Reviews* for July.

THE VALUE OF AMATEUR SPORT.—The value of amateur sport as recreation, or as a factor in attaining *mens sana in corpore sano*, depends absolutely upon its healthfulness. Even as the ethics of the college, the club, or the individual athlete must be above suspicion, so the ultimate success of any branch of amateur sport, its degree of usefulness, and its measure of pleasure-giving, all rest upon the game being kept above reproach.

When I contrast the amateur baseball of ten years ago with that

maintained to-day by clubs, athletic and otherwise, I feel as though its greatly increased popularity had been neutralized by the lower ethical standard. Ten years is not such a very long period in the history of so long-lived a game as baseball, but it has been long enough to completely change the type of spectators at the professional games, to professionalize more than half the amateur clubs, and even here and there to taint an occasional university nine.

Years ago, before the professional league players developed contumely for public support, and contempt for sporting canons, and before the revelations of "fixed" games, their contests attracted the best class of sportsmen. Now of that class only a few enthusiastics continue in attendance. Only seven years ago we had good amateur baseball around New York—an association and a most interesting series of games. But that was when clubs had sportsmen on the Board of Governors, and before the days of the "summer-nine" player.—*Harper's Weekly.*

THE REAL SECRET OF THE BICYCLE'S POPULARITY.—Now the bicycle has offered to the great majority of citizens a means of athletic exercise and open-air enjoyment for which they need not be specially equipped by nature. Man and woman, weak and strong, dwarf and three-hundred-pounder—all sorts and conditions of men—can and do learn to wheel, and with comparatively small perseverance become as proficient for all practical purposes as the most handsomely endowed athlete of them all. This is the true secret of the bicycle's firm hold on the public, and here is its greatest value.—From "About the World," in the July *Scribner's.*

THE DEAD OF ST. PETER'S.—And far below all are buried the great of the earth, deep down in the crypt. There lies the chief apostle, and there lie many martyred bishops side by side; men who came from far lands to die the holy death in Rome—from Athens, from Bethlehem, from Syria, from Africa. There lie the last of the Stuarts, with their pitiful kingly names. James III., Charles III., and Henry IX.; the Emperor Otho II. has lain there a thousand years; Pope Boniface VIII. of the Caetani, whom Sciarra Colonna struck in the face at Anagni, is there, and Rodrigo Borgia; Alexander VI. lay there awhile, and Agnese Colonna, and Queen Christina of Sweden, and the Great Countess, and many more besides, both good and bad—even the Caterina Cornaro, Queen of Cyprus, of romantic memory.—"St. Peter's," by Marion Crawford, in *The Century* for July.

MASSAGE IN SPRAINS.—No two *masseurs* are alike by nature nor in skill, tact, and education, and the one who knows his anatomy and physiology well, when called to a recent acute sprain, will not begin at once to *masser* the injured joint, but at a distance above it on the healthy tissues by gentle stroking or *effleurage* toward the heart, gradually proceeding nearer and nearer to the painful place. This has a soothing effect and pushes the flow along in the veins and lymphatics, making more space in them for the returning currents coming from beyond and carrying away the fluids that have leaked out of the vessels. The same should be done on the part of the limb beyond the joint, for the circulation is hindered both in going out and coming in by reason of the swelling.

Next, the *masseur* who knows his business will begin again at a safe distance above the injured joint, and use deep rubbing, kneading, or massage properly so called, one hand contracting as the other relaxes, alternately making circular grasps, with the greatest pressure upward, and this should be done on the parts above and below the seat of sprain. By this procedure the effects of the previous stroking or *effleurage* are much enhanced, an analgesic or agreeably benumbing effect is produced upon the nerves which extend to the painful place, and the retarded circulation is pushed along more vigorously, making room in the vessels for the swelling, the effusion, the dammed embargo caused by the landslide of blood and lymph that is inundating the surrounding territory with exudates farther up the stream to float off, and preparing the way for the next step in treatment. At the end of fifteen or twenty minutes of this manner of working, gentle, firm pressure can be made immediately over the swollen and but recently very tender parts, which in a few seconds can have circular motion, with the greatest push upward added to it; and this, if sufficient tact be used, will in all probability not hurt but be positively agreeable.—DOUGLAS GRAHAM, M. D., in *Appletons' Popular Science Monthly for July.*

THE REAL CONEY ISLAND.—The West End is the most bewildering, noisy approach to Bedlam that we know of in America. The singers in the concert halls and the variety shows have lengthened their dresses and abbreviated their misbehavior, and the worst criminals who swindled the people or pandered to their weaknesses have been banished, so that the place does not reek with evil as it did; but it is still the seat of a delirium of raw pleasure. Physically, the place is a sort of Chinatown of little frame buildings

set about, helter-skelter, like a cityful of houses in a panic. Aurally it is a riot of the noises of roller-coasters, from two to six stories high; of test-your-lungs and test-your-strength and test-your-grip machines; of shooting-galleries, and "see-if-you-can-hit-the-nigger's-head" contrivances; of those strange merry-go-rounds which seem to be manufactured exclusively in New Utrecht, L. I., of animals designed by a baker of ginger-bread; of razzle-dazzle rings that go all ways at once, like a ship's compass; of a band of howling Sioux; of the yells of the shouters in front of the freak museums; of rocking-boat devices that would make Neptune seasick if he rode in them; of "ring-the-cane and get-a-cigar" layouts; of hand organs; of yelling sea-bathers; in short of pandemonium.—From "Coney Island," by JULIAN RALPH, in the July *Scribner's.*

THE VENICE OF TO-DAY.—That which first strikes the observant stranger in Venice to-day is the fact that the Venetians have absolutely and entirely lost their grip upon the beautiful. Nothing on earth can be finer than the art of its glory; nothing in the world can be viler than the so-called art of its decadence. That the descendants of the men who decorated the palaces of five or six hundred years ago could have conceived, or endured, the wall-papers, the stair-carpets, and the hat-racks in the Venetian hotels of the present, is beyond belief. Whatever is old is magnificent, from the fresco of St. Christopher by Titian in the Chapel of the Doges, to the window of the Cicogna Palace on the Fondamenta Briati. Whatever is new is ugly, from the railway station at one end of the Grand Canal, to the gas-house at the other. And the iron bridges, and the steamboats, and the band-stand in the Square of St. Mark, are the worst of all.

The modern Venetian dealers in second-hand portraits and the venders of bric-a-brac of all kinds seem to have learned their strict and universal Economy of Truth from the memorial tablets over their shops. If you are offered here an article of original, home-made present-time antiquity for five lire, you may depend upon getting it for two lire and a half, and you may be sure that it costs you, even then, about twice as much as it is worth. If an inscription in old Latin or in choice Italian tells you that "Here lived" some particular Venetian hero of sword or pen, you may put down in your diary that he probably visited next door, or that he died over the way.—From "Literary Landmarks of Venice," by LAURENCE HUTTON, in *Harper's Magazine* for July.

THE SCIENTIFIC AMERICAN has reached the mature age of fifty years. It is therefore with commendable pride that its editors and proprietors have prepared a special Anniversary Number, with four times the usual number of pages, to celebrate the occasion. This number contains reviews of the progress made in the last fifty years in the sciences and the arts, gives historical sketches of some of the most notable inventions made during this period, and is filled with interesting illustrations. Among the subjects treated are: The Transatlantic Steamship, Naval and Coast Defense, Railroads and Bridges, The Sewing Machine, Photography, The Phonograph, Telegraph, Telephone, Iron and Steel, Physics and Chemistry, Progress of Printing, The Bicycle, Electric Engineering, Telescopes, Ocean Telegraphy, Distinguished Living Inventors (Portraits), Shipyards of the United States, a large group of distinguished inventors, reproduced from an old steel engraving, is presented. The Anniversary number is provided with a characteristic cover, and is printed in a style fully up to the regular issues of the paper. It will doubtless be generally preserved for future reference. A very large edition of this interesting number is being issued. All articles have been contributed by specialists, and are of great value as a work of reference. In size, this issue is equivalent to an ordinary sized book of 442 pages. Subscription price, $3 per year, or for the special, 10c. a copy. Munn & Co., Publishers, New York.

THE REVIEW OF REVIEWS for July is a strong political number. The portraits of prominent men of all shades of politics are numerous and interesting, and the editorial comment on the present situation is luminous. The *Review* is the only monthly which is able to keep fully abreast of all political movements and changes. It is never caught napping. The action of the St. Louis Convention, on the 18th of June, is already history to the *Review of Reviews*, which appears on the first day of July; indeed, that action had been definitely and accurately predicted in the number of the month previous. The *Review* has shown such possibilities in political magazine journalism as had not been dreamed of in the philosophies of the magazine editor of the conventional type.

The most thorough and authentic study of William McKinley's character and career that has yet appeared in periodical literature is contributed to the July *Review of Reviews* by Mr. E. V. Smalley, the well-known journalist, whose intimate knowledge of Republi-

can party politics and long acquaintance with the public men of Ohio render him peculiarly adapted for such a task. Mr. Smalley was himself born and reared on the "Western Reserve," only forty miles from McKinley's Poland home, and he writes with full personal knowledge of the Major's early environment. The article is well illustrated.

ANNOUNCEMENTS.

AMERICAN PUBLIC HEALTH ASSOCIATION.

The Twenty-fourth Annual Meeting of the AMERICAN PUBLIC HEALTH ASSOCIATION will be held at Buffalo, N. Y., September 15-18, 1896.

The Executive Committee have selected the following topics for consideration: The Pollution of Water Supplies; Disposal of Garbage and Refuse; Animal Diseases and Animal Food; Nomenclature of Diseases and Forms of Statistics; Protective Inoculations in Infectious Diseases; National Health Legislation; Cause and Prevention of Diphtheria; Cause and Prevention of Infant Mortality; Car Sanitation; Prevention of the Spread of Yellow Fever; Steamship and Steamboat Sanitation; Transportation and Disposal of the Dead; Use of Alcoholic Drinks from a Sanitary Standpoint; Centennial of Vaccination; Relation of Forestry to Public Health; Transportation of Diseased Tissues by Mail, and River Conservancy Boards of Supervision.

Upon all the above subjects special committees have been appointed. Papers will be received upon other sanitary and hygenic subjects also.

All papers presented to the Association must be either printed, type written, or in plain handwriting, and be in the hands of the Secretary at least twenty days prior to the annual meeting, to insure their critical examination as to their fulfilling the requirements of the Association.

All communications relating to local matters should be addressed to Dr. Ernest Wende, Chairman Local Committee of Arrangements, Buffalo, N. Y.

IRVING A. WATSON, Secretary.
Concord, N. H.

AMERICAN SOCIAL SCIENCE ASSOCIATION.

The General Meeting of 1896 will be held in Saratoga, beginning Monday, August 31, and closing Friday, September 4.

The Opening Address will be given by the President, F. J. KINGSBURY, LL.D., of Waterbury, Ct., Monday evening, August 31, at 8.00 P. M., on "*A Sociological Retrospect.*" The Annual Report of the Secretary will follow, the main subject being "*A Glance Forward.*"

The program is admirable and well calculated to attract deserved attention.

For particulars address. .

F. B. SANBORN, General Secretary.
Concord, Mass.

THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.

The Sixth Annual Meeting of THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION will be held on Tuesday and Wednesday, September 29th and 30th, and Thursday, October 1st, 1896, in Allston Hall, The Studio Building, on Clarendon street, near St. James avenue, Boston, Mass.

EMIL HEUEL, M. D., Secretary,
352 Willis avenue, New York.

MISSISSIPPI VALLEY MEDICAL ASSOCIATION.

The Mississippi Valley Medical Association will meet at St. Paul, Minn., *September 15, 16, 17, 18,* in order to permit the members and their families to take the opportunity accorded, by this change of time from previous annoucement, to make a pleasant tour through the Yellowstone Park, so justly celebrated as the WONDERLAND of America.

H. W. LOEB, M. D., Secretary,
St. Louis, Mo.

CHLOROFORM VERSUS PSALMS AS AN ANALGESIC.—It was in attendance on a young primapara. She suffered very much and chloroform was administered. She duly appreciated it as will be seen.

Her mother, a very pious and sympathetic old lady, remarked to her: "My daughter, when I was in labor, I always got a great deal of relief by repeating the 23d Psalm. Now you repeat after me."

Mother—"The Lord is my shepherd, I shall not want."

Daughter—"The Lord is my shepherd, I shall not wa'-wa'-wa'. I want some chloroform! Mama! Please don't bother me just now with psalms."

THE SANITARIAN.

SEPTEMBER, 1896.

NUMBER 322.

HYGIENIC PRECEPTS AND HOW AN EPIDEMIC WAS STAMPED OUT.

A REMINISCENCE OF PROF. FRANK H. HAMILTON.

The late distinguished surgeon, Frank H. Hamilton, M. D., is credited with the formulation of the following decalogue:

1. The best thing for the insides of a man is the outside of a horse.

2. Blessed is he who invented sleep—but thrice blessed the man who will invent a cure for thinking.

3. Light gives a bronzed or tan color to the skin; but where it uproots the lily it plants the rose.

4. The lives of most men are in their own hands, and, as a rule, the just verdict after death would be—felo de se.

5. Health must be earned—it can seldom be bought.

6. A change of air is less valuable than a change of scene. The air is changed every time the wind is changed.

7. Mold and decaying vegetables in a cellar weave shrouds for the upper chambers.

8. Dirt, debauchery, disease, and death, are successive links in the same chain.

9. Calisthenics may be very genteel, and romping very ungenteel, but one is the shadow, the other the substance, of healthful exercise.

10. Girls need health as much—nay, more than boys. They can only obtain it as boys do, by running, tumbling—by all sorts of innocent vagrancy. At least once a day girls should have their halters taken off, the bars let down, and be turned loose like young colts.

In the summer of 1866 there was an outbreak of cholera at the workhouse on Blackwell's Island. A full account of it is published in the first volume of the SANITARIAN, describing the conditions which led to it and how it was stamped out, of which the follow-

ing is an abstract—pertinently applicable to recurring conditions in that and other institutions subject to the same kind of management:

The first case recognized was on July 22d. Three or four weeks before there was an epidemic of diarrhoea among the inmates. The weather was exceedingly hot and it so continued during the two weeks following. Many of the cells were overcrowded, four persons in some cases occupying one cell of 16 by 8 feet. Open buckets were used at night for the excreta, and these remained in the cells until morning. During the day most of the women remained within the building, sitting in the sewing room without employment, while large numbers were crowded into a single room making hoop-skirts. A few only were employed in scrubbing, washing, etc. The men were occupied out of doors. The water closets used during the day by the women were in two empty cells on the third floor of the building, in each of which were two or three tubs of the size of half barrels, placed under properly constructed seats. These tubs were emptied at night into the river, filled with water and left out twenty-four hours, other tubs taking their places during the next day. Most of the day these closets were thronged with women, part of whom came of necessity, but many came merely to avoid work, and to meet and converse with their companions. The soiled clothes and bedding were put in water over night, sometimes piled up without water, and subsequently washed in hot water. Mush and molasses constituted the evening meal, and there was not a sufficient supply of vegetables. The bread was sour. During the month of July, the water pipes conveying the Croton water under the East River to the Island were more than once broken, which in some degree interfered with the thorough cleansing of the Island and the buildings. Such were the conditions in brief, when on "July 26th, at midnight, the Asiatic cholera broke out with great violence in the workhouse." Sixteen cases occurred within the next twenty-four hours. The number of new cases rose and fell from this date until August 2d, on which day there were reported 33 new cases, making in all up to this date 127 cases. At the time of the outbreak there were in the building 649 prisoners. Prof. Frank H. Hamilton, at the time one of the visiting surgeons of Bellevue Hospital, was chairman of the Committee of Inspection of the Medical Board of Charity Hospital, including the workhouse, almshouse and penitentiary. It had been his custom to make only occasional visits to the workhouse,

and no report of the outbreak of cholera in the building was made to him until Aug. 2d, on which day, as already stated, 33 new cases occurred. Then, as now (as may be inferred from recent action in allowing experimentation with nostrums on the patients without consulting the Medical Board), the Commissioners of Public Charities conceived themselves to be abundantly competent to direct everything appertaining to the material welfare and use of those committed to their charge, without consulting the Medical Board. Nevertheless, Prof. Hamilton took it upon himself to go outside of his sphere (as conceived by the Commissioners) of merely attending the sick, and made a careful inspection of the building and its inmates. The findings were as above described. He *asked permission* of the Board to introduce at once certain sanitary improvements. Observing apparent hesitation to accept his suggestions, "perhaps on account of the expense," the urgency of the case was pressed upon them, with assurance that if full authority were given him in the matter the epidemic would be arrested in three days. "This was said deliberately and without fear of a failure, because the special causes of the epidemic were apparent to me, as they would have been to any other educated physician, and the remedies were within reach."

Before the close of the day authority was given to Dr. Hamilton to make such changes in the management of the various institutions upon the Island as he saw fit. His orders were issued and began to take effect on the 3d of August, but they were not in full operation until the 4th. On the 7th of August there was but one new case, "and the epidemic was virtually at an end."

The Changes Instituted.

1. The women were distributed and made to occupy, as far as possible, separate cells.

2. No buckets were allowed in the cells for excreta, and neither the doors of the cells nor the outer doors of the workhouse were locked at night. Those having occasion to rise in the night were required to go to the river-side closets, to tubs placed outside of the building, or to the hospital.

3. During the day none of the unemployed women were permitted to remain in the hospital; the hoop-skirt shop was closed and the women employed on this contract were sent into the grounds and allowed to sit in the shade of the buildings or of the trees from 4 to 8 o'clock P. M.

4. The cells heretofore used as water closets were cleansed and closed, all the men and women being required during the day to resort to the river-side closets.

5. All clothes and bedding used by hospital patients were ordered to be removed promptly, and to be placed in large vats containing boiling hot water, and not to be washed until they had been in the water several hours.

Through some inadvertence, the orders given for the management of the laundry were not literally carried out for several days. The clothing, instead of at once being placed in boiling water, was submerged in cold water for a few hours, often over night, and then treated with hot water. The result of this omission was, that of 34 women employed in the laundry, 12 died—35 per cent. of the whole number.

6. At breakfast, coffee was substituted for rye-coffee; potatoes were added to the meat dinner; rice and tea were substituted for mush and molasses for supper. The resumption of the mush and molasses at the penitentiary, a few weeks later, considerably increased the amount of diarrhoea.

7. A large proportion of the cases being developed during the night, and most of the inmates, both men and women, being accustomed to the free use of stimulants, a "night-cap" was ordered for each person, composed as follows: Whiskey, one fluid ounce; tincture of capsicum, fifteen minims; water, three fluid ounces. M.—For those who had already some diarrhoea, tincture of opium, fifteen minims, was added.

8. Stoves were placed in the rooms occupied as hospitals, and fires were kept in them constantly to improve the ventilation, the windows being kept constantly open.

9. Disinfectants were employed freely everywhere they might prove useful. But cleanliness being enforced, there was very little of these agents used.

Quite a number of cases were noted where choleraic symptoms rapidly supervened upon a debauch, or the free use of alcohol under the impression that it exercised a prophylactic influence. Several of these were less than ordinarily exposed to recognized sources of infection. Of the nurses who were seized, a debauch had very uniformly preceded the attack. One nurse—who was very faithful in the performance of her duties—experienced choleraic symptoms on three different occasions, after having each time too freely taken whiskey to support her strength.

PUBLIC BATHS ESSENTIAL TO PUBLIC HEALTH.*

By MOREAU MORRIS, M. D.,
Vice-Chairman of Mayor's Committee on Baths and Lavatories.

Bathing of the human body as recorded in sacred and ancient history was a prescribed sacred ritual for purification, especially for accidental, leprous or ordinary uncleanness.

A bathing chamber was probably provided in the houses of the lower ranks in early times, as well as in those of the wealthy, the latter with much elaboration and elegance. These were often in the gardens of the wealthy.

The pools of Bethesda, Siloam and Hezekiah are among the first indications of public baths established for promiscuous public bathing.

In all religious ceremonies the high priests were required to purify themselves by bathing before performing religious services. Uncleanness of person was considered sinful. Even the leper was commanded to go wash in the pool of Siloam seven times before he could be made whole.

Body exhalations are impurities oftentimes poisonous, infective and contagious, and which nature by her constant physiological activity in the human system, through sensible and insensible perspiration, endeavors to get rid of. Healthy conditions can only be maintained by removing these poisonous elements from the cutaneous surface by bathing. The millions of cutaneous pores, covering the whole body surface, must be relieved of these exudations or ill-health will be the result. Purification increases cutaneous blood circulation, stimulates nerve radicals, eliminates and removes effete and poisonous accumulations and renders the blood purer, promoting healthy action and strength.

Athletic training of gladiators and soldiers of the olden times among the Greeks and Romans by the daily use of the bath was considered indispensable. At the present time no athlete, whatever the sport, can afford to ignore this most important adjunct in his preparation for any great physical effort. Our common laborers and muscular toilers need the bath quite as much, to remove the effete body exhalations from their perspiring bodies, to maintain strength and muscular activity. All health resorts through-

* Read at a public meeting held in the Aldermanic Chamber, City Hall, New York, 1896, Mayor William L. Strong, presiding.

out the civilized world hold forth their bathing facilities as great inducements to those seeking renewed health.

The treatment of diseased conditions at the present day is largely relegated to the various water appliances. Impure air, unbathed bodies, absence of sunlight, are largely the inciting factors of the poisonous germs of typhus, as of less malignant diseases. Where else can we find this combination better than in the densely-populated tenement house districts of this city? Here no baths are provided in their airless and sunless domiciles. Impurity, uncleanness and ill-health go hand in hand. In the lodging houses again do we find like conditions intensified. Typhus fever—that fatal disease—easily finds lodgment therein.

In the tenements the practice of bathing is almost an impossibility. A tub filled with water drawn from the faucet in the kitchen or in the hallway, or by lugging it up from the yard hydrant, is the only resort. In this limited supply the water quickly becomes befouled, and the impossibility of cleanliness by its use is evident. "Such conditions do not encourage the practice of bathing."

A bath that does not effectually remove from the surface of the body all impurities and constantly supply fresh pure water is not a bath of purification. A small modicum of surface dirt may be washed off, but the pores of the skin are but partially relieved of their clogged-up mouths filled with the effete products of physiological activities. Neither is the cold bath alone sufficient for good purification. Hot or very warm water, with plenty of soap, is necessary to dissolve and remove the oleagenous exudations which are always present.

In the sea water swimming baths the saline condition of the water is an important adjunct for cleansing purposes, useful and invigorating, provided the water is clean, free from sewage contamination. Objectionable as this may be, from a sanitary point of view, the popularity of these cooling, pleasure-giving, summer swimming baths is shown by the enormous number of bathers. For the year 1895 there was a total of 4,900,000 baths taken, and of these 1,800,000 were by females. What number of persons, then, is a pertinent question, would avail themselves of a system of free public baths with hot and cold water always provided the year round?

No better system for promoting the public health could be devised, except perhaps tearing down both front and rear tenement houses, where impaction takes place and where sunless and airless abodes are the rule. The frequent use of these public baths with

hot and cold water will become immensely popular, affording the facilities for a cleanly body the year round.

The new system of the bath itself will also be a factor for its popularity. Instead of the tub, the plunge or the too forcible shower bath, the construction of the spray or rain water principle presents a most admirable feature, wetting the whole unclothed surface with a pure, constant flow of fresh water, all impurities immediately being discharged and removed entirely from the body and the bath-room. Again, free public baths maintained the year round, winter as well as in summer, would beyond question enhance the cleanliness of the tenement house dwellers, lessen the danger of diseases, and would be a safeguard against the spread of epidemics.

The Tenement House Commission of 1894, in their exhaustive and admirable report to the Legislature last winter, state that: "Very early in their enquiries they were confuted with the problem of Public Baths. It is evident, in the opinion of the Committee, that the bathing habit is growing among the masses of the people, and it is also evident that the practice stands greatly in need of encouragement by means of increased opportunities. * * * The Secretary reports that, out of a total population of 255,033 covered by the Committee's inspection, only 306 persons have access to bathrooms in the houses in which they live. * * * The freer use of water by the tenement house population would aid them very materially in their struggle for existence, by assisting the elimination from their systems of the poisons absorbed in the sunless and airless dwellings.

"That several hundred thousand people in the city have no proper facilities for keeping their bodies clean is a disgrace to the city and to the civilization of the nineteenth century. * * * The cultivation of the habit of cleanliness has a favorable effect also upon the character, tending to self-respect and decency of life.

"It therefore favors the building, at the beginning, of at least one fully-equipped bathing establishment on the best European models, affording every kind of bath desirable, at moderate charges."

The report further says: "That the work of the Tenement House Commission of 1884 was reviewed in the light of original recommendations, and in compliance with them the following section concerns baths and the Commission's opinion. (Sec. 19.) That the city establish free winter baths throughout the tenement house districts of the city."

Foreign cities, such as London, Birmingham, Glasgow, Paris and Berlin have recognized the importance of the bath in public hygiene, its value in the prevention of disease, and thereby promotive of public health.

The hygienic environments that will unquestionably surround public bathing establishments and public comfort stations will directly and indirectly be conducive to the elevation, both physically and morally of those now compelled, for want of proper facilities, to go unbathed for weeks, months and even years.

It needs no extended argument to convince any intelligent person, that such conditions of personal uncleanness are very great menaces to health and danger to the public. The recent developments of the science of bacteriology have demonstrated the presence of subtle, poisonous germs, and that the body exhalations of an unwashed sample of humanity, sitting next to us in our crowded cars, may communicate a deadly typhus germ without our consciousness.

In the Special Report of the United States Commissioner of Labor we cannot omit to note the astounding fact that 96.67 per cent. of the houses investigated were entirely without the accommodation of a bathtub in the tenement house districts of our city.

In view of the imperative need of a system of public baths as a means of healthful living, all sanitary officers agree that they are a necessity for counteracting the unsanitary conditions of the tenement and occupiers of lodging houses.

Of the dangers and menace to public health from lodging houses alone, interesting in this connection, the following summary furnished by the President of the Health Department shows that in the city there were 112 lodging houses. (Three have since been closed.) In these were a total of lodgers allowed, 15,233.

A total without baths of any kind	55
" " of lodgers allowed in these	6,372
" " with baths	57
" " of baths in these	95
" " of lodgers allowed in these	8,861
" " of baths with hot water	56
Total average use of baths daily	546
Free baths	54
Paid	3

Is not this a fearful comment on the menacing condition of personal uncleanness of the occupants of lodging houses typical foci

of typhus fever and other disease germs—and with intensified danger by reason of this unwashed multitude of 15,233 individuals being permitted nightly in lodging houses among whom the daily use of baths is only 546.

Moreover, that the mere provision of hot water and a tub is not always a sufficient inducement for a cleansing bath is shown by the replies of some of the patrons of lodging houses, when asked their opinion of bathing accommodations, as follows:

C. D. replies: "The tubs can only be used from 5 to 7 A. M."

J. M. replies: "The shower baths are the best for taking the dirt off a fellow."

R. G. replies: "The tubs are never cleaned out from their appearance."

T. W. replies: "Can't get a good wash without hot water."

W. B. replies: "The tubs are only an advertisement, not clean."

F. S. replies: "Find too many old medicine bottles for my taste."

P. M. replies: "Not enough hot water."

J. L. replies: "Do not like bath tubs."

B. replies: "Bad enough to sleep in a lodging-house, without using their bath tubs."

WOMAN'S DRESS REFORM.—"The only way to start a reform of the present idiotic fashion of woman's dress is to give woman an object lesson in comfort and good sense," said Mrs. Lumsden, President of the Brooklyn Health Culture Club, recently. "This our club proposes to do. Our object is wider than dress alone, but we will begin with that. My attention was first attracted to reformation of woman's dress when I began to ride a wheel. I have a costume the skirt of which falls just below the knee, where it meets high boots. Often I've left my wheel and strolled through the parks sketching, and the exquisite sense of comfort and freedom of movement which I experienced caused me to ask, 'Why have I been idiot enough to trail five or six yards of haircloth, velveteen and other heavy fabrics about for all these years?' I saw a woman trying to carry a baby on one arm, hold an umbrella and hold up her skirts one of the wet days last week, and that crystallized the idea which had long been forming in my mind. Some friends who had come to feel the folly of their style of dressing were as anxious to do something as myself, and so we formed the Health Culture Club. All of our members are prominent in social and professional life."

BATHS FOR GERMAN MINERS.

On the Continent, mining companies have, of late years, devoted much attention to providing facilities for the miners to perform their ablutions and to change their wet and dirty clothes, so as to enable them to return home refreshed, in dry and warm clothes. In Germany, lavatories were provided in the earliest times, but they rarely consisted of more than a number of washing basins or buckets. In the course of time, however, improvements were introduced. Floors were made of cement or asphalt, and enameled iron basins provided, and the dressing room was separated from the lavatory. As the mining industry developed, it was found that such arrangements did not suffice for the large number of men employed, and plunge baths were introduced in Westphalia. At first the miners did not take to them, for fear of catching cold. Indeed, some doctors went so far as to say that miners coming from warm working places underground softened their epidermis too much by warm baths, and were liable, especially in winter, to catch cold on their way home.

The installation of baths at the schools gave an impetus to bathing, and as parents and children gradually began to like the innovation, the number of miners using the baths rapidly increased, until the accommodation afforded by the plunge baths was insufficient. An event of great importance was the invention of a douche, or shower bath, shown in 1870 at the Berlin Health-Exhibition, specially designed for industrial use. With this, the whole question of public, school, and workmen's baths entered upon a new era. A method was thus found of cheaply and rapidly giving large numbers of persons the advantage of a bath. The bath of the future is undoubtedly the shower bath. It requires the smallest quantity of water, it enables a large number to bathe at once and in privacy, and by the action of the separate drops of water it has an excellent mechanical cleansing action.

According to an interesting report published by Franke, in the Prussian official mining organ, there were, in 1893, in the mines of the Dortmund district, 209 lavatories at 167 collieries, with 232 shafts. In these, washing facilities were afforded to 132,450 men,

or 95.7 per cent. of the entire mining population. The lavatories are quite close to the mouth of the shaft or adit, the average distance being 100 feet. At several of the pits, the lavatories can be reached without the men having to go out into the open air, and most of them are so arranged that the surrounding buildings afford protection against the weather. In 117 cases entirely separate buildings are used, and in 92, lavatories form the chief portion of the buildings, the other portions being used for lamps and for offices. The buildings are usually of brick, roofed with wood, corrugated iron, or roofing felt. The floors are of cement, asphalt, flags, plaster, bricks, or wooden grids. In many cases, the washing and dressing rooms are distinct. In 139 lavatories there are 365 baths, averaging 1 yard depth of water, and in 90 lavatories, there are 2,526 shower baths, 10 of which are supplied with cold water and 2,516 with warm water. The water used is usually river or well water, mine water being used only when it is clean and good. The water is, in most cases, heated by steam. The lavatories are usually heated by steam pipes.

It has not yet been decided whether it is desirable to separate the miners according to age. In Westphalia, it is usual to separate the lads under 16 from the men.

Baths have certainly proved attractive to the Westphalian miners. In 1892, in the Dortmund district, 83.2 per cent. of the miners bathed daily; the cost of each bath is calculated at 1 cent, and occupies five minutes. A very elaborate lavatory has been erected at the Hibernia mine, Gelsenkirchen, of which drawings have been published in the Prussian official mining organ (1895). The plant comprises shower baths for 1,600 miners, and private bathrooms for the managers and overseer.

The success that has attended the use of lavatories in Westphalia led to the erection of two admirable establishments at the Dudweiler and Kreuzgraeben collieries, in the Saar coal field. An illustrated description of the Dudweiler installation is given by Dr. Fueller in his new work on industrial hygiene, reviewed in the Colliery Guardian last week. From this the following particulars are taken:

The massively built house, which is in direct communication with the mouth of the adit, has an internal area of 108 by 61 feet. The height to the roof is 16 feet. Two high, double walls divide the building into three sections, two of which serve for the married miners and the other for the young unmarried ones. Light is fur-

nished by forty-five windows and three skylights, and, at night, by three arc lamps. The floor is of cement, with a slope of 1 in 40. There are 55 shower baths, each in a cell, 5 of these being supplied with cold water and the others with water heated in summer to 86° F., and in winter to 95° F. Each cell measures 4 feet 6 inches by 3 feet 3 inches, and is used by two miners at the same time. The cold-water cells are somewhat smaller and are arranged for one person only. In the dressing rooms, there are a number of forms, and for each man's clothes there is a hook and line running over pulleys at the ceiling. The clothes hung up at the ceiling dry very rapidly. Each hook is marked with the man's lamp number. The building is heated by steam pipes. For a bath, 7 gallons of water are required. Of the 1,900 miners employed at the mine, 1,200 bathe regularly. Seven hundred miners, however, live in barracks where ample washing accommodation is provided. The lavatories have been in existence at Dudweiler and Kreuzgraeben collieries since 1891, and have answered their purpose admirably.

H. F. MERRITT,
Consul.

BARMEN, *November 23, 1895.*

CLIMATE OF THE ORANGE FREE STATE.—Consular Agent Landgraf, at Bloemfontein, says that:

No country on earth can rank with the Orange Free State as a health resort. Mr. Patterson had been all over the world and nowhere else found any relief. I could give numbers of similar cases, and that so few people have come here is due to the fact that the Orange Free State is so little known, and in most parts of the world believed to be a desert, inhabited by brutal natives and wild beasts. The country is pretty well populated and cultivated. Living is rather expensive, and persons coming here should command from $50 to $60 per month. A family of four or five persons can live decently on $1,500 per year.

Persons whose lungs are far gone should travel by stages from the sea to the Orange Free State—that is such persons should stay for a month at Ceres, next at Beaufort West, etc., until they are prepared to stand the dry climate of the Orange Free State. A direct journey to Bloemfontein would mean death to such persons. The landing place is Capetown.

PURIFICATION OF WATER BY METALLIC IRON.

In the United States, comparatively few efforts have been made to secure proper water supplies. Thus far, not more than one-third of the towns and cities have made any effort to insure wholesome drinking water; the remainder either confess indifference or ignorance of the subject. In other words, more than one-half of the people in the United States are living in total disregard as to whether they are drinking pure or contaminated water. Spasmodic efforts are made now and then to open the way to the desideratum by asking Congress or State Legislatures to provide legal protection against the fouling of public waterways—a scheme which, in our vast country, where rivers traverse several States, would seem to be impracticable. What law, for example, can Congress enact to remove the sources of deleterious impurities which find their way into the Potomac River without interdicting industries or agricultural operations on or near the banks of the river and its numerous tributaries—wastes from factories, washings from farmyards, drainage from villages, towns, and cultivated fields laden with the microbes of various fertilizers? It is well enough to inculcate the doctrine of "rainfall to the river and sewage to the soil," but in order to reach the river the rainfall must pass over or through the soil, and in doing so, it necessarily carries with it an appreciable quantity of filth which contaminates and renders unfit for domestic uses the waters of the streams.

What, then, can be done to make these waters of disease and death living waters of health? London (where 4 out of every 1,000 people in the world live), not many years ago, had a fearful experience from the consumption of water furnished by the Thames and fouled by filth which found its way into the river above the sources of supply. The operation of the "pollution of rivers act" did not alone succeed in correcting the evil; but sand filtration of the entire water supply, before it entered the city, proved an efficient safeguard against disease-bearing germs, and has given the city not only absolute immunity from cholera, but has greatly reduced typhoid, and London is to-day the healthiest city in the world. This process, then, may be said to answer well for Thames water, pro-

tected as it is by the strictest sanitary surveillance; but where microscopic organism of a dangerous character exist in the water in large quantities, it has been found quite impossible to bring such water to a pure or potable condition simply by sand filtration, which is now supplemented in many continental cities by first agitating the water to be purified with bits of metallic iron, and then passing it through sand filters.

This process was suggested about ten years ago by Sir Frederick Abel, and was first practically applied at Antwerp, where foul water, drawn from a source little better than a sewer, has been converted into a drinking water—bright, clear and wholesome; and this explains why Antwerp has been so free from epidemics of cholera and other diseases since these works have been in operation. This method of purifying water can no longer be considered in the experimental stage; it has been installed in some of the important cities of Holland, France, Turkey and India, and has been recommended for improving the water supply of Florence, Italy, by Sir Douglas Galton, the eminent English engineer and sanitarian. While it can not be said that the process gives a perfect water, it certainly gives one which is wholesome, as has been shown in many continental towns.

When the process was first introduced at Antwerp, its original birthplace, by Dr. Anderson, who designed the mechanical appliances for agitating the water with scraps of iron, it was considered that the iron had a more or less pronounced chemical action upon the dissolved organic impurities of the water, but it now seems that the real action is one of coagulation, the formation of a precipitate in the water tending to throw out of solution the dissolved organic substances, and this view of the process applies equally well to its action upon microbes, which become entangled in the gelatinous precipitate, and either subside with it to the bottom of the settling tank or remain behind on the surface of the sand filter through which the water is passed.

After being agitated with the metallic iron, Dr. Dupre examined water where there was only sand filtration and found the microbes were from 1,300 to 3,000 per cubic centimeter, but directly the iron process was applied, the number sank to 100; they very rarely exceeded that, and, sometimes, went down as low as 5. The effect of filtration of water by this process is not so much to remove chemical substances as to remove microbes. It is true that water may be foul and objectionable irrespective of microbes,

but the main advantage of the iron process is that it removes the microbes so completely. Dr. Dupre says:

"This can only be done by very perfect sand filtration at the rate of 4 inches per hour, but if the rate is varied by half an inch per hour, or an inch, the whole process breaks down, and you jump at once into hundreds of microbes. With the iron process, you may vary the rate from 4 inches to 20 inches without apparently affecting the numbers at all. The film of iron which is formed is such a perfect medium that even continued disturbances in the rate does not seem to affect the result."

The apparatus for purifying the water is a hollow cylinder, either of cast iron or built up of plates like a boiler, supported horizontally upon hollow trunnions, through one of which the water to be purified enters; after traversing the cylinder, it leaves by the other trunnion. The cylinder is caused to rotate about its axis by means of a gearing, which is driven in any convenient way. Fixed inside the shell of the cylinder, and running longitudinally are six shelves, five of which are curved in the direction of the motion of the cylinder. The sixth shelf is not curved, but is formed of a number of square flat plates arranged en echelon to insure a more continuous and regular action of the apparatus.

The cylinder is charged with a certain quantity of metallic iron, according to size—a purifier capable of treating 1,000,000 gallons of water in twenty-four hours requiring a charge of two tons or more. The iron may be in any convenient form, but that most commonly employed in practice is burrs or punchings from plates. Cast-iron borings are very efficient, and, weight for weight, much cheaper. The charge of iron, in whatever form, is spread evenly along the bottom of the cylinder before commencing the work.

The water, on first entering the cylinder, strikes against a circular baffle plate, which directs the stream toward the shell and prevents it from passing through axially. As the cylinder rotates, the curved shelves scoop up the charge of iron and shower it down through the water as they reach the top, thus causing a constant falling of the iron across the current of the water. Practically, it is a process by which the iron is filtered through the water. The outlet pipe terminates inside the cylinder in an inverted bell or hood, coming as low down as the shelves will permit. The object of this contrivance is to prevent any iron from being carried out of the cylinder by the current. The revolving purifiers are made in fourteen sizes, distinguished by the diameter of their inlet pipes,

from 1 to 14 inches. In large installations, batteries of purifiers are employed, placed side by side, very frequently all discharging into a common outlet tank.

Mr. Anderson, who has presented a considerable mass of evidence showing the value of the process for the purification of water supplies, states that the effect of the agitation with iron upon the water is simply to cause a small quantity of iron—from one-tenth to one-fifth of a grain per gallon—to be dissolved, or, rather, held in solution, in the form of ferrous hydrate, which quickly changes under the influence of the air to ferric hydrate, which is precipitated in particles more or less coarse, according to the nature of the water to be treated. At Antwerp and other places, where the earliest applications of the process were made, a tank or reservoir existed before the purifiers were applied, and was consequently utilized. In more recent plants, where the works have been designed specially for the process, the expensive settling tank has been replaced by a trough or flume, along which the water runs on its way to the filters.

From the settling arrangement, the water passes on to the filters, which are sand beds of ordinary construction and call for no particular remark, except that the sand need be neither specially fine nor of great depth. Through the filters, the water passes at the rate of 80 to 100 gallons per square foot per twenty-four hours, and emerges pure and free from any trace of iron.

A very important feature of the iron process consists in the rapidity with which perfect results are secured. A few years ago the Massachusetts State Board of Health, after an elaborate series of experiments, showed that an ordinary sand filter would not remove any considerable number of microbes in water until its surface had become sufficiently blocked by a layer of matter (or filth-destroying bacteria), separated from the water being filtered. To obtain this result, it was necessary to work the filters for several days, delivering all the while imperfectly filtered water, until this layer had time to form. With the iron process no such thing occurs. The filter yields, from the first, water containing the minimum number of germs. We know that any accidental disturbance of the surface of the sand of an ordinary filter seriously impairs its microbiological efficiency, but by the iron process the filters are wonderfully tolerant of such disturbances. After working one of these filters a fortnight, the film was purposely broken up by dragging a chain over the surface of the sand. One hour after this

operation, a sample of the water was taken and found to yield only 40 microbes per cubic centimeter, and subsequently hourly samples yielded from 31 to 67 microbes per cubic centimeter. The original water, before filtration, contained from 20,000 to 100,000 microbes per cubic centimeter.

The following is a history of the reception of the iron process in France: About five years ago, the process attracted the attention of the largest and most influential water company in France—the Compagnie Generale des Eaux, of Paris. After having investigated the process at the places where it had already been adopted, the Compagnie des Eaux wished to have further proofs, and the Revolving Purifier Company, which was formed in 1889 to work the process, undertook to demonstrate its efficiency in dealing with the water of the Seine, taken below Paris, at the pumping station of the water-works of Boulogne-sur-Seine, close to the Pont de Sevres, not far from the outfall of the sewers. Accordingly, a complete plant was erected, capable of dealing with 100,000 gallons of water in twenty-four hours, consisting of a 6-inch purifier, delivering into a long settling trough and filters to correspond. This plant ran for some months, and amply proved the correctness of all that had been claimed for the process to the complete satisfaction of the Compagnie des Eaux, who closely followed the trials and made all requisite analyses. The next step was the application of the process to the whole of the water pumped from these works. The trial plant was removed, and two 10-inch purifiers erected, capable of treating rather more than 1,000,000 gallons daily. The results have been most gratifying. The Seine water at the point of intake, though not very heavily loaded with organic matters, is very rich in microbes, the average result of some analyses indicating the presence of nearly 400,000 per cubic centimeter. Dr. Miquel, the eminent head of the bacteriological department of the Observatoire de Montsouris, was commissioned to investigate the working of the process here, and during the period from February to July, 1893, took twenty-two sets of samples for analysis. The purified water was on each occasion compared with the spring water of the Vanne, which is considered to be the model of what a drinking water should be. The result of his analysis is surprising. Of the twenty-two samples of purified water examined, no less than eleven were either equal or superior to the water of the Vanne on the same date, as regards bacterial purity, while the average of the whole set of samples of purified water gave a figure which does not

greatly exceed the average of the Vanne water. The average number of microbes removed was 99.57 per cent. of those existing in the original water. The Boulogne works being the first really designed throughout to work the Anderson process, it was of great interest to see how the working expenses came out. It is satisfactory to find that the cost of purification is very low. The following detailed figures give the working expenses for one year:

Description.	Working expenses.	
	Francs.	
Iron (at 7 francs per 100 kilograms)	350.00	$67.55
Cleaning decanting reservoirs	180.00	34.74
Cleaning filters	780.00	150.54
New sand	300.00	57.90
Coal, oil, waste, etc	1,400.00	270.20
Total	3,010.00	580.93

Installations have also been made at Libourne, Nice, Monaco, Mentone, and Villefranche-sur-Mer. The total output of the Nice works ranges from 6,000 to 8,000 cubic meters a day, or from 1,300,000 gallons to 1,700,000 gallons. The installation works well and the purity of the water is all that can be desired.

Early in 1894 a contract was signed between the prefect of the Seine, acting on behalf of the department, and the Compagnie Generale des Eaux. The Compagnie des Eaux in this contract undertook to construct works on the Seine and the Marne, above Paris, capable together of purifying 70,000 cubic meters daily, or nearly 15,000,000 gallons, and to remove 99.6 per cent. of the microbes in the original water. These works were to be in full operation by the 1st of January, 1896. The total cost was estimated to be 12,000,000 francs ($2,310,000).

C. W. CHANCELLOR,
Consul.

HAVRE, *February 27, 1896.*

JUST SO.—A young doctor desiring to make a good impression upon a German farmer, declared he had received a double education. He had studied homoeopathy, and was also a graduate of a "regular" medical school. "Oh, dot vas nodding," said the farmer, "I had vonce a calf vot sucked two cows, and he made nodding but a common schteer, after all."

STREET CLEANING.*

Probably the most serious and perplexing of the many problems that confront the greater New York commission in framing a charter for the extended city is the question of street cleaning. A metropolis, second only to London in population and presenting a congestion of traffic which the English capital can scarcely equal, emphasizes the necessity of clean streets with tenfold force, by comparison with the small, sleepy and provincial towns of the days before the war, when even New York had barely passed the three-quarter million mark and Brooklyn was not more than a fifth of its present size. Inasmuch as the increase of street traffic has kept pace with the growth of population, the street cleaner of to-day finds the task of removing street refuse much greater than formerly, and the consequences of negligence or inefficiency more serious from a sanitary point of view. When we reflect that of the $45,000,000 expended by the New York city government no less than $3,300,000, or approximately 7½ per cent., is for street cleaning, the importance of the subject becomes manifest. The present authorities spend as much money as the old Tammany regime, with this difference: A large sum is used, but the streets are clean; Tammany spent as much and left the streets dirty. The Brooklyn system is less expensive, but not more satisfactory, than the present New York method. Will the system adopted under the new charter obviate any of the existing evils?

City streets must be kept clean regardless of cost, but the cost is still a matter to be considered. Unquestionably, we are spending far too much money for street cleaning, but the question of how to effect the much needed economy in this matter is an unsolved problem. Paris is the cleanest city in the world and the French metropolis secures this happy condition at a much smaller cost than is the case in New York or Brooklyn. A description of the system which produces results impossible with us is peculiarly interesting at this time.

Paris is kept clean despite poor facilities for drainage and disposal of garbage. It may be noted by way of preface that the pave-

* From the *Brooklyn Eagle*, commenting upon the section on street cleaning of the proposed charter for Greater New York.

ments of Paris cover an area equal to that of a field a mile wide and more than five miles long, or 3,500 acres. Much the larger portion of this street surface is paved with stone blocks; but, as elsewhere, macadamized and asphalt surfaces are substituted on many streets, and of late pavements of wooden blocks have come into vogue, finding favor in particular in the vicinity of school buildings and wherever else noiseless traffic is especially to be desired. The stone pavement is by far the most economical, as it costs on an average but 76 centimes per square meter annually to keep it in repair, while the asphalt surface costs 2 francs; the macadamized, 2 francs, 17 centimes, and the wood, 2 francs, 80 centimes. The aggregate annual cost of keeping all pavements in repair is $2,000,000. This has no reference to cleaning the streets, but only to putting them in readiness for traffic. It is a most essential preliminary, however, as the streets could not possibly be kept clean if they were not also kept in perfect repair.

The refuse demanding the attention of the street cleaning department of Paris, as of any other great city, may be divided, speaking generally, into two classes. First, pavement garbage, caused largely by the traffic of 100,000 horses and about three millions of people, and, second, ash barrel garbage, by which term may be described such waste products of indoor living as cannot be removed via the sewers, but must be carted off through the streets. Unlike New York and most other cities, Paris handles these two kinds of garbage according to different systems. For convenience of description the one may be spoken of as the street cleaning system, the other as the scavenger system. It is the function of the street cleaning department to sweep the streets, all suitable matter being deposited in the sewers. It also collects such matter as is not receivable by the sewer in piles convenient for removal, and sprinkles and washes the pavement surface. The ash barrel garbage and the bulkier portion of the pavement garbage is removed by the scavenger service. So thoroughly systematic and efficient is the street cleaning service that although all the pavements are swept clean every morning, only a force of 3,200 men is employed, and most of these only for a few hours each day. For street cleaning purposes the city is divided into 150 districts or ateliers, each of which is presided over by an official known as a cantonnier, who is required to look after all the streets in his territory. The force and equipment which experience has shown to be necessary are provided for each of the above districts. The cantonniers and their

subordinates are salaried officials, who receive from 100 to 125 francs ($20 to $25) per month for their services. For this liberal pay they are required to give their entire time to the discharge of their duties. The other employes are engaged and paid by the hour. Strong men are given from 32 to 37 centimes, and women, children and weak men from 25 to 30 centimes an hour, the labor being performed during the morning hours.

The sweeping is mainly done by machines drawn by one horse, hand brooms being employed only in a supplementary way. Both in summer and winter work begins at 4 A. M. First comes a watering machine to settle the dust, and this is followed in narrow streets by a single machine, and in wider streets two or even three machines are used in succession, the foremost one being nearest the centre of the street. This cavalcade passing up one side of the street and down the other shifts all the garbage into the gutters. It is followed by one man who flushes the gutters and sends all but the bulkier portions of the garbage into the sewer openings located at short intervals between the hydrants. Each of these machines is reckoned as equal to twelve Parisian hand sweepers, each of whom is supposed to sweep 500 square meters in an hour. Each division of watering carts and sweeping machines has its well defined district to cover, and so accurate is this apportionment of territory among them that all the divisions complete their alloted tasks at practically the same time. By 8.30 o'clock the entire city has been swept clean and the accumulations of the previous night carried by the sewers to the Seine.

During the remainder of the day the work of the official employes varies in different parts of the city. In some sections the watering carts and sweeping machines make a second tour, and this time are accompanied by a large force of hand sweepers for the reason that the active traffic renders their operations less regular than in the early morning hours. A city ordinance which requires all horses to be smooth shod to prevent needless wear of the asphalt pavements, makes it necessary that such pavements be sprinkled with sand to prevent horses from slipping.

A most important feature of the Paris system is the constant sprinkling of all the streets with water, and water everywhere is free as air. The street sprinkling is largely accomplished by horse carts (of which 370 are utilized in summer), but in part also by hand carts, and very largely by hose attached directly to hydrants. This last is the most economical method and one-third of the entire

street service is sprinkled in this way. In addition to this liberal sprinkling, the entire road bed of each street is flooded from the hydrants at regular intervals, varying from one to three days, and all gutters are flushed twice every day. From a hygienic standpoint this free use of water which prevents the germ laden dust from rising into the air, is the most important feature of a well nigh perfect street cleaning system.

The entire service thus far described is controlled directly by the city government and all its officials and employes are paid from the city treasury.

With the scavenger service, however, by which all the bulkier garbage is removed, the case is quite otherwise. Although for this service also, as in the other, the city is subdivided into districts for economy and efficiency, the work is done by contractors to whom the various districts are let for periods of three years, the contract in each instance being let to the lowest bidder. The garbage is the property of the contractor, who, except under certain restrictions, may remove it in his own way with such a force of laborers as may be necessary. The power of the cantonnier over the district he sweeps is quite similar to that of the contractor in the removal of garbage. What would at first seem an anomaly, that is the fact that the city does not itself control the disposal of the garbage, results from the circumstance that the accumulations coming under this head have a commercial value. It is hauled to the outlying districts near the city and sold to market gardeners for fertilizing purposes. Up to a recent period, the contractors paid the city for this material, as it could be sold at a profit, but latterly, owing to the growth of the city, the distance to which the garbage must be hauled eats up this profit and the municipality now pays the contractor for the removal of the material. Even now, however, the entire cost to the city for the removal of garbage, which amounts to about a million tons annually, is only about $400,000 a year.

So simple is the scavenger system that only a few words are needed to describe it. The garbage wagons set out on their various routes at 6.30 A. M. in summer and 7 in winter. The districts are so laid out that each wagon on an average covers a section inhabited by 3,500 persons. These wagons are of monster size and each is drawn by two or three horses and accompanied by four men, a driver, and emptier and two lifters, and a woman follows with a broom to complete the work.

So systematically and quickly is the work done that by 9.30 all

the garbage in the city is on its way to the suburbs. Usually the material is conveyed to its destinations in the wagons in which it was first collected.

It is here that the picturesque element of the Paris street cleaning system claims attention. The garbage gleaner searching ash barrels for scraps of possible value is a familiar sight in every city, but in Paris this humble calling has developed into a trade in which upward of 41,000 persons are employed. Professionally they are known as "biffins," or "chiffoniers," who regard their trade with sentiments of pride. Humble as is this calling there are various grades in it and the novice must serve an apprenticeship before attaining to the rank of a full fledged cantonnier. During his apprenticeship the novitiate wanders about the streets searching ash barrels and acquiring familiarity with the tricks of the trade. At length an expert gleaner introduces him to the quarter of the city where the chiffoniers live, in different establishments, presided over by a proprietor, who furnishes the lodgings and purchases the gleanings. With this change the night picker becomes a "courrier," or habitual runner, and equipped in the usual manner with dorser (lantern) and crochet (hook) and instructed in the proper methods of the trade, working only at daybreak, when the ash barrels and boxes are set out upon the sidewalks. Ultimately, the graduated gleaner is assigned to a specified territory with exclusive rights therein, which are fully respected by his fellow chiffoniers. This step gained he has reached the top round of his profession and is known as a "placeur," or placeman. So well established is the proprietary right of the "placeur" to his territory that he may even sell it, and in a favored locality the price received is from $10 to $40. The right of the purchaser is equally secure of recognition. The reputation for honesty enjoyed by the chiffoniers seems to be amply justified by the frequency with which articles of value found in the ash barrels are returned to their owners.

The gleanings which accrue to the chiffoniers cover a wide range of articles. First in the list is old paper (including books and pasteboard), ropes and thread, wadding and cotton, rags of all sorts, metals, remnants of earthenware, horsehair, human hair, horn, fragments of whalebone, cork, India rubber, bones, grease, old leather and rabbit skins, and bread crusts. So great is the diversity of industries carried on in an old city like Paris that for each of these apparently insignificant articles there are special dealers who handle nothing else. For example, there are fifty merchants who

handle nothing but old rags, and twenty firms, some of them being large concerns, that purchase only scraps of paper.

It is estimated that the gleanings of the placeur bring him sometimes as much as fifty cents a day and that a majority of courriers realize 30 cents a day, while even the apprentice or night runner may make 20 cents a day. The total sum received annually by the entire army of chiffoniers for the gleanings rescued by them from the garbage boxes is estimated to exceed $5,200,000—about three times the sum expended by the city on its entire street cleaning department. The gross weight of the material daily gathered by the chiffoniers and restored to channels of usefulness is estimated at about 1,250 tons. All this is the more remarkable when we consider that the mass of material handled by the unofficial chiffonier is not only of no value to the contractor who owns the garbage, but actually detracts from its value for fertilizing purposes.

There is one difficulty, however, with which the street cleaning system of Paris, perfect as it is in all its official and unofficial details, has failed to overcome. When at long intervals, there is a heavy fall of snow, the street cleaning system is for the time being clogged, but as such storms are infrequent the lack of an effective means of removing the "beautiful" is, after all, not a serious matter.

One cause of the superior cleanliness of Paris streets is the special care taken by the authorities to keep the road beds in thorough repair. This explains the ease with which the smooth, unbroken surfaces may be swept clean.

The most serious difficulty in the way of an adoption by Brooklyn or New York of the Paris street cleaning system lies, perhaps, in the fact that we are not French. We are the most extravagant nation on earth and in reckless wantonness throw away vast quantities of material which a Frenchman would regard as a means of wealth. A French cook would make a fine dinner from a piece of meat which a Brooklyn butcher would throw away. One of the chief annoyances comes from scraps of paper, which with us have no commercial value. Dealers will not handle small quantities of rags, while in Paris rags may be sold in small lots of only a few pounds. The time may come when these conditions will change for the better and all articles of any value whatever, in small as well as large quantities, will be saved and utilized commercially to the fullest extent. We will then reach that improved economic condition to which Paris has long since attained. In the meanwhile we must wait and waste as of yore.

SUBURBAN SANITATION.*

By G. B. Thornton, M. D.,
President of Memphis Board of Health.

With the growth and development of a city the necessity for a uniform system of sanitation is apparent, and suburban sanitation is equally as necessary, though to a superficial observer not so apparent. This general proposition is applicable to any city, and many cities outside of this State could be cited to prove the assertion. But for this occasion we may limit the discussion to the leading cities of Tennessee with the view of eliciting an interest toward influencing legislation whereby those suburban communities which so desire may be provided with sewers and other facilities necessary to promote the public health and maintain a higher standard of local sanitation. These necessary appliances on a scale commensurate with the general good of an extensive area or district, sufficiently populated to be considered, can only be had and properly maintained by conventional action of the communities interested. Owing to the vastly increased and highly improved facilities for personal transportation, which were a few years ago remote, unoccupied localities, are now thickly settled suburban neighborhoods, to say nothing of the immediate suburbs of a growing city, where an infectious disease at once becomes a menace to the suburban population.

THE SANITARY APPLIANCES,

such as sewers, public water supply, street cleaning service, garbage and house waste removal, sanitary inspectors and all of the necessary outfit of a well-organized and well-equipped public health service of a city is not complete in its beneficial influence unless co-extensive with suburban districts or intelligently co-operated with by them as far as a street car service extends. A system of sanitary police inspection, with the view of reporting and isolating cases of infectious disease, as practiced by the city and county boards of health, are essential toward preventing the spread of such diseases. But many diseases of an endemic character, not classed as infectious, can be prevented by good local sanitation, or rather would not occur in the absence of unsanitary conditions, such as cesspools, defective house drainage, damp, wet lots in

* Read at meeting of Tennessee Medical Society, at Chattanooga, July, 1896.

close proximity to dwelling houses, etc. The prevention of these conditions, except to a limited extent, can only be had by intelligent co-operation or concert of action by the whole community interested. Cases of typhoid fever, for example, or a low grade of continued malarial fever equally as insidious and possibly more prevalent in some localities, have occurred in some of the best houses of the most attractive suburban neighborhoods, traceable directly to drinking

WATER POLLUTED BY UNDERGROUND SEEPAGE

from a neighboring cesspool or privy pit in the yard, into which water closets, bath tubs and kitchen sinks are discharged. Some suburban districts have the public water supply mains extended through them, and many houses the plumbing and modern conveniences of the best sewered portions of the city, without public sewers or proper facilities for disposing of liquid refuse of any character. Water is the best means of disposing of all liquid or semi-liquid house waste, provided a proper outlet is had for its final discharge. For the mains of a public water supply system to precede the mains of a public sewer system is obviously wrong, as has been demonstrated in a number of instances by just such conditions. This is putting the cart before the horse, to use a common expression. It is commencing an important work at the wrong end. Water alone, without the pollutions incident to domestic uses improperly disposed of, whether on the surface or underground in built-up portions of city or suburbs, creates nuisances in more ways than one. Hence the importance of both underground and surface drainage at all seasons of the year. This is illustrated by stagnant pools along the beds of natural drains and low, wet places, which, if added to by pollutions of sewage and the deposit of silt, become veritable breeders of disease.

In the suburbs and outskirts of all cities are located various kinds of factories, slaughter houses, stock yards, milk dairies, etc., around which but little if any regard is had to cleanliness and local sanitation. These are all necessary industries and create more or less trouble as population increases around them. To meet conditions of this kind a comprehensive system of underground and surface drainage, subject to inspection and regulation by official authority, supported by favorable public sentiment, can alone insure satisfactory results. The obstacles in the way of unincorporated communities to create and to maintain a public sanitary system adequate in extent and appointment is the inability to levy and collect a uni-

form tax for this specific purpose, even granting that a majority of the property holders or residents are willing to the tax, unless some special legislation could be had for this purpose.

Be the scheme or plan what it may in a legal aspect, there must be co-operation between the urban and suburban communities to make it mutually beneficial. The disposal of sewage so that it is not offensive to individuals and deleterious to property interests is a serious question, and one that is now and likely to remain a troublesome one to those charged with its responsibility. The same physical conditions do not apply to all cities and their suburbs, nor is the temper and prevailing sentiment of the people of any two just alike, hence a different plan, both as to engineering and legal questions involved, should be adjusted to meet the necessities of each individual case. The problem of suburban sanitation, together with a number of other questions, including all the police regulations of an incorporated town or city, have been solved by the extension of city limits. But in some instances this can not be done, owing to an inability of the urban and suburban populations to agree upon all important questions necessary for such extension, though they may be practically a unit upon the one question of the desirability of preserving the public health, and that one question can not be eliminated and treated separately from all the rest under existing laws.

For the purpose of illustration, Memphis and its suburbs will be cited as an example where suburban sanitation is now a seriously interesting question with the officials and many of the most prominent residents of the city and suburbs. Memphis has approximately a population of 60,000, and immediate suburbs or the territory within a radius of one mile an estimated population of 20,000. This is possibly the best sewered city in the State, and one of the best in the whole country. It has sixty miles of sewers in successful operation, fifty and one-half miles of which are the new or small pipe system, and discharge by two main outlets into the Mississippi River—one below the wharf or main business portion of the city, and one into Wolf River near its mouth, above the business portion. The other four and one-half miles are some old sewers built by private parties prior to the yellow fever epidemics of 1878 and 1879 but now owned by the city and included in its general system, which discharge by two outlets into the Mississippi River just above the wharf or steamboat landing. The history of this sewer system, including a technical description, its cost, main-

tenance and utility, is worthy of careful consideration by the student of city sanitation. The system now embraces nearly the whole of the city, and has cost to date $427,739.09, nearly a half million dollars. The maintenance of the system, including repairs to sewers and flush tanks, the cleansing of sewers, removal of obstructions, etc., cost for the year 1895 $3,022.38, as shown by official report from the engineer's office. The work of sewering Memphis was commenced in the spring of 1880, and has been added to each year, as circumstances would admit. By the end of this year (1896) it is proposed to complete the work as far as the city proper is concerned. This will cost about $30,000 more.

The sewers of Memphis are an inestimable blessing to all classes of its citizens, and, though procured at a heavy cost, have proven a good investment. The area of Memphis is only four square miles, with a population of nearly 60,000. It has three-quarters of a mile less area than Chattanooga, which has an estimated population of 40,000. Within the past seven or eight years the suburban population has increased relatively greater than the urban. and continues to do so in most every direction. There are several reasons for this, viz., cheaper property or lots for residence or manufacturing sites and to avoid the corporation tax, the extension of a splendid electric street car system in eight different directions for several miles into the country, whereby people can be brought from their suburban homes into the city and vice versa in a few minutes at small cost. Regular and rapid transit is now a necessity for all growing cities, and sanitary science and its appliances must be used to successful ends to keep pace with a rapidly developing period or be a laggard in the grand march of improvement.

In 1895 there were sixty-one cases of scarlet fever, forty-one cases of diphtheria and seventy-two cases of small-pox reported in Memphis. In the suburbs forty-two cases of scarlet fever, seven cases of diphtheria and fifty-six cases of small-pox. This is a very unusual report for small-pox. Such as this has not occurred for many years, and is not likely soon to occur again, if ever. For the past year or two the disease prevailed to a greater or less extent in a number of cities, and in many country districts in several States, North and South. Incidentally it may be mentioned that Shelby county is well supplied with hospital accommodations for this disease, and very few cases were allowed to remain at their homes, but were promptly moved to the hospital, which is well located five miles from this city.

Through the courtesy of Dr. J. Berrien Lindsley, secretary of the State Board of Health, the following statistical information of Nashville, Knoxville and Chattanooga is given: These cities should be, and doubtless some day will be, as much interested in suburban sanitation as Memphis is now. Nashville enlarged its corporate limits in 1890 and included an extensive suburban district. It has now an area of nine and one-half square miles, and according to the report of Dr. W. W. Core, county health officer of Davidson county, has an estimated population of 87,754. It has forty-one miles of sewers and an electric street car system which extends several miles into the country. For 1895 there was reported in the city 321 cases of scarlet fever, 18 cases of diphtheria and — cases of typhoid fever. For the suburbs no estimate of population is given. An approximate or estimated number of 148 is given for scarlet fever, diphtheria and typhoid fever, with 13 deaths. These three diseases are reported together, and, though indefinite, answers the present purpose, viz., to show the necessity of suburban sanitation, and that any infectious disease in the suburbs is a menace to the city. There are neither sewers nor public water supply in its suburbs, nor is there any apparent interest to have them.

In regard to Knoxville, Dr. L. Jones Price, county health officer of Knox county, reports estimated population of city 30,000, and the estimated population of the suburbs, that is within one mile from the corporation line, 20,000, including North and West Knoxville, 10,000 more outside of these corporations. According to this estimate the suburban population of Knoxville equals the urban. The city and suburbs have an electric street car service. The city has a public water supply and sewers, but the suburbs neither, nor is either contemplated or desired by suburban residents.

Dr. J. L. Selman, health officer of Chattanooga, and Dr. T. E. Abernathy, health officer of Hamilton county, report estimated population of Chattanooga 40,000, and suburban population 15,000. They differ as to extent of sewers in Chattanooga. One reports 7 35-100 and one 35 miles, but agree as to no sewers in suburbs and none contemplated or wanted, though the suburbs have the public water supply. Chattanooga has a steam and electric street car service, which extends through its suburbs. Neither report cases of zymotic diseases, diphtheria, scarlet fever, typhoid fever, etc., in either city or suburbs. It seems no official mortality records are kept, or possibly were not conveniently accessible to these

gentlemen for reference at the time reports were made to Dr. Lindsley. Chattanooga has an area of four and three-quarters square miles, is a manufacturing city and railroad center, and in some respects one of the most enterprising and progressive towns in the State. It seems the question of suburban sanitation has not yet interested the people, but as the suburbs fill up and become more populous, the same necessity for sanitary appliances will arise there as in the city.

As suburban population increases in number and density around any city the same necessity will arise for sanitary appliances as exists in the city proper. All cities are sooner or later confronted with these questions and have to provide for them in some way, either by corporate extension or concerted action under an agreed system and uniform health ordinances. Tennessee has a good system of county health boards, which should be encouraged by a strong public sentiment and co-operated with by all city boards. The good effect of this policy was clearly demonstrated in Memphis and Shelby county during the prevalence of small-pox in that locality the past winter. By prompt concert of action between the city and county boards of health an epidemic of small-pox was averted.

A PLAN MUST BE DEVISED.

To solve the question of suburban sanitation in Tennessee without extending the lines of existing corporations some scheme must be devised having the force of law, supported by approving public sentiment. But let the plan be what it may, the taxing power must be placed somewhere, either in a county court or by extension of the taxing authority of existing corporations beyond present limits, or to authorize private corporations for the construction and maintenance of sewers in unincorporated districts. In any event rules and ordinances of the city interested should apply over such sewered districts. This would involve compulsory house connections and proper maintenance in good working condition of such connections between house and public sewer. A scheme of this kind would facilitate the enlargement of incorporated towns and one, and possibly the most important, step toward extension would have been taken. The financial question of reimbursing a suburban district or private sewer company at an agreed valuation is easily done, as was done in the case of Memphis when it projected its general system by purchasing the four and one-half miles owned by private companies before it built its present sewers.—*Commercial Appeal, Memphis.*

TOPOGRAPHY, CLIMATE AND MINERAL SPRINGS OF CONNECTICUT.

By A. N. Bell, A. M., M. D.

Connecticut is situated in lat. 41°—42° 3′ N., and long. 71° 55′—73° 50′ W., comprehending an area of 4,674 square miles. It lies between Massachussetts on the north and Long Island Sound on the south, Rhode Island on the east and New York on the west. Its boundary lines, however, are all irregular—not one of them is straight; that on the north, having a notch where the town of Southwick., Mass., interrupts the boundary; the eastern following at its lower portion the sinuosities of Pawcatuck River; the southern being the line of the Sound shore; and the western boundary, after following a course south, slightly bearing west till within about fifteen miles of the Sound, suddenly turns southeast for about eight miles, next southwest for about thirteen miles and then southeast for six or seven miles. The northern line is eighty-eight miles long; the eastern, forty-five miles; the western, by the indirect line described, seventy-two miles. The sea or Sound coast, from Pawcatuck River on the east to Byram River on the southwest, is about one hundred miles. The average length of the State from east to west is eighty-six miles, and its average breadth from north to south, fifty-five miles.

The surface is hilly to a remarkable degree; there being no prairies and but little level land. The central valley begins at the Sound, and, embracing a tract of the average breadth of about twenty miles, including the towns of East Haven, New Haven and West Haven, passes northeast, its eastern border crossing the Connecticut River below Middletown, while its western border continues on the west side of the river through Hamden, Cheshire, Southington, Farmington, Avon, Simsbury and Granby into Massachusetts; the eastern border passing at the same time through Portland, Glastonbury, Manchester, East Windsor and Somers to the Massachusetts line.

The lower part of this valley is sandy and alluvial, but barren

except when it is highly manured. In many places it forms extensive plains of drifting sand, and these sometimes invade the portions which have, under the stimulus of strong manures, grown a moderate crop. But at the point where it approaches the Connecticut River the character of the soil changes; the underlying rock for the remainder of the course of the valley through the State is red sandstone, and above it a rich, deep clayey loam, with sand enough to make it permanently arable; and there is hardly any section of the United States which yields, year after year, such ample crops as this portion of the valley of the Connecticut River. There are in the lower and western portions of this valley some ranges and several isolated buttes or elevated bluffs of trap-rock, which in some volcanic eruption or earthquake was interjected through rifts in the overlying rocks. On the west side these bluffs have a precipitous and sometimes an almost perpendicular descent, while on the east side they descend to the level of the valley by a gentle declivity. There are also two or three cross ranges, of no great height, of trap-rock, connecting with mountains on the eastern or western border of the valley.

These trap ranges are broken by several gaps, cutting them completely through; one of these affords a passage for the Farmington River; another opens a way for the railroad from Hartford to Waterbury.

The eastern part of the State, which is drained by the Thames and its affluents, has no broad valley, but numerous narrow ones, and the underlying rocks being granite and metamorphic, the hills which bound these valleys are gently rounded slopes, cultivatable even to their summits. This portion of the State is excellent grazing land, and much of it is celebrated for its dairy products; while the numerous waterfalls and the uniformity of the streams make it a favorable region for manufactories, which are largely conducted in this section. The western part of the State, drained by the Housatonic and its tributaries and by the Tunxis, is of broken surface, with sharp cliffs and large boulders, while the surface is much of it covered with rock.

Less than a moiety of the land is susceptible of successful tillage, and the passage from one valley to another over the rough and precipitous hills is very difficult.

Many of the valleys, though narrow, afford good and succulent pasture, and the butter, cheese, and condensed milk of Litchfield county have a reputation far beyond the limits of the State.

South of the point (Brookfield), where the Housatonic turns south-eastward, the western part of the State is sandy and gravelly, though portions of it yield fine crops by the application of highly stimulating manures.

The proximity of this portion of the State to New York has led to extensive culture of the small fruits and vegetables, which find a ready market in the metropolis. The shore line for a distance of from 5 to 15 miles back from Long Island Sound is alluvial and diluvial and very sandy, but by the application of large quantities of menhaden and other fish and guanos, yields good crops of potatoes, rye, oats and Indian corn. There are no elevations deserving the name of mountains in the State, the highest elevation being considerably below 1,000 feet.

The State is mainly drained by its three principal rivers and their tributaries, the Housatonic, the Connecticut, and the Thames, though these are supplemented by numerous small streams from ten to fifteen miles in length, and one, the Quinnipiack, about thirty-five miles long, which, as also the larger rivers, all discharge their waters into the Sound.

The Housatonic rises in the northwestern part of Berkshire County, Mass., pursues a generally southern course till it reaches about the middle of the State of Connecticut, when it turns southeast and discharges its waters into the Sound at Bridgeport.

The Connecticut, rising near the Canada line, separates New Hampshire and Vermont, and passes through Massachusetts and Connecticut to the Sound, deflected at Middletown to the southeast, like the Housatonic and Thames and on about the same parallel.

The Thames, a broad and noble river, is only known by that name from Norwich to New London Harbor. The Yantic and Quinnebaug unite to form the Thames at Norwich, and the Quinnebaug itself takes the Shetucket as its principal tributary—formed by the union of the Willimantic and Hop rivers. These streams drain most of Windham and a part of New London counties. The chief affluent of the Housatonic is the Naugatuck River, which receives the waters of several towns of Litchfield and New Haven counties.

The Climate of Connecticut is in no material respect different from that of the adjacent States. Away from the shore of Long Island Sound the snow lies on the ground for many months, and the winter weather is intensely cold. In the valley of the Connecti-

cut, and indeed along the other rivers and amid the hills, heavy fogs commonly prevail during a portion of the summer and in the autumn months, and to these some writers have been wont to attribute the large percentage of deaths from consumption. But there is in fact no excess of consumption in Connecticut over the other New England States. It is considerably less than in some of them. As summed up by this writer in another place,* the percentage of deaths from consumption to the total number of deaths from all causes was found to be for the New England States, respectively: Rhode Island, 14.8; New Hampshire, 15.5; Massachusetts, 15.7; Connecticut, 16; Maine, 19.2; Vermont, 20.2.

The publication of sanitary reports and current sanitary literature generally, consequent upon increased attention to practical sanitation during recent years, in Connecticut, as in the other New England States—indeed throughout the country—is an educational force of immense importance. It is only during these recent years that the causal relations of defective drainage, impure water, polluted milk, wet cellars and stifling bed rooms, to malaria, typhoid fever and consumption have begun to be appreciated.

And proportionately as knowledge of such preventable causes of disease is displayed and their removal insisted upon by the health authorities, the people will be turned from their false conceptions and appreciate the results of practical sanitation.

The Mineral Springs of Connecticut are as follows:

Cold Spring, Oxford, New Haven County, Geo. F. Barker, analyst.

Chalybeate.

Iron carbonate,	grains per gallon.....	0.91
Sodium sulphate,	" "	0.49
Magnesium sulphate,	" "	0.62
Calcium sulphate,	" "	1.16
Sodium chloride,	" "	0.34
Silica and insoluble matter,	" "	1.33
Organic matter,	" "	1.27
Loss,	" "	0.10
Potassium sulphate, Lithium sulphate.....		Traces
Total,	" "	6.22

*Climatology and Mineral Waters of the United States, p. 116.

Stark Mineral Spring, Bozrah, New London County. S. W. Johnson, analyst.

Alkaline.

Sodium bicarbonate,	grains per gallon	.....	0.29
Potassium bicarbonate,	" "	.....	0.10
Magnesium bicarbonate,	" "	.....	0.32
Calcium bicarbonate,	" "	.....	1.23
Iron bicarbonate,	" "	.....	0.06
Sodium sulphate,	" "	.....	0.18
Sodium chloride,	" "	.....	0.33
Silic acid,	" "	.....	0.85
Total,	" "	.....	3.37

Arethusa Spring, Seymour, New Haven County. R. H. Chittenden, analyst of samples submitted (May 17, 1894).

Alkaline.

Silicia,	grains per gallon	.....	0.607
Calcium carbonate,	" "	.....	0.431
Sodium chloride,	" "	.....	0.247
Magnesium carbonate,	" "	.....	0.128
Potassium sulphate,	" "	.....	0.095
Sodium sulphate,	" "	.....	0.203
Sodium carbonate,	" "	.....	0.015
Ferric Oxide and Alumina,	" "	.....	0.009
Total,	" "	.....	1.735

Those with no published analysis, are:

"*Chalybeate*" Springs—Bald Hill, Portland, Middlesex County; Cromwell, Middlesex County; two miles south of Kent, Litchfield County; four miles south of Litchfield, Litchfield County; The Pool, North Haven, New Haven County; Strong's Mill Spring, Chalybeate and Sulphuretted, Colchester, New London County.

"Sulphur" and Sulphuretted Springs—Holbrook Mineral Spring, Lebanon, New London County; Kenyons' Mill Spring, Colchester, New London County; Mineral Springs, North Woodstock, Windham County; Sulphur Spring, Nepaug, Litchfield County.—Stafford Springs, Tolland County—appear to have been at one time in much repute: "The springs are two in number. The first discovered contains iron, held in solution by the carbonic acid, or

fixed air, natron or native alkali, a small proportion of marine salt, iodine, soda, magnesia, and some earthy substances. The other is charged principally with hydrogen gas of sulphur; it also contains a very minute portion of iron. The spring first discovered has been pronounced by chemists to be one of the best chalybeate springs in the United States." Trumbull's History of Connecticut, 1818. Prof. L. W. Shepherd, in his report of the Geological Survey of the State, in 1837, speaks of them as being, at that time, the most important mineral springs in the State.

CANNED HORSE MEAT WITH AMERICAN LABELS.—Consul du Bellet writes from Rheims, June 9, 1896: I have the honor to inclose herewith a clipping from Le Courrier de la Champagne, a leading newspaper of this city, with a translation of the same. If the facts reported are true, I consider it of the utmost importance that our exporters of canned meats should be informed of the use that is being made of their labels in Europe, so that they may put a stop to a fraud which, if tolerated, is calculated to ruin their export trade to Europe.

Sad End of English Horses.—The judge of the police court of the Thames has rendered a judgment in a case insignificant in itself, but in which we find valuable information to consumers of canned goods. A driver, called Almond, was charged with having inflicted cruel treatment on horses, an offense which is severely punished by the English law. The charges having been proven, he was rather heavily fined. The interest centered on the employer of the brute, who, of course, appeared in behalf of his man and testified to the kind disposition of the latter. As he was explaining that Almond was daily intrusted with the care of driving to the docks and putting on board horses bound for Rotterdam, the magistrate remarked that the ill-treated horses were so old they could hardly stand up, and asked the employer to what use the Dutch put such animals. In reply, the employer explained, in the most unconcerned manner, that there existed in Rotterdam and Antwerp large and important factories where the invalid omnibus horses of London were converted into excellent canned beef and retailed throughout Europe in sealed boxes with American labels. This industry absorbs, it is said, more than 26,000 horses every year.

VIVISECTION JUSTIFIABLE.*

By H. P. Bowditch, M. D.

The vivisection question reduced to its simplest expression may be stated as follows: "Have we a right to give pain to animals in order to study the phenomena of life?" In answering this question we perceive at once the necessity of a clear conception of what pain really is, and in striving to obtain this conception we are struck by the fact that pain is a purely subjective phenomenon. We *know* absolutely nothing about pain, except that which we have ourselves suffered. We infer, of course, when we hear another person describe a painful sensation, that his feelings are similar in a general way to those which we imagine we ourselves should experience under like circumstances. This assumption of similarity of sensation is justified by the facts of our common human nature; but we are often struck, when listening to such descriptions, by the apparent difference between the impressions produced upon different individuals by the same external cause. A trifling surgical operation, which will not be considered worth mentioning by one individual, will, to another, be apparently the source of most acute suffering. We are thus led to suspect that, even in the circle of our own acquaintances, there must be quite a wide range of sensibility to pain. If we extend our observation over a wider field, we find reason to believe that in the human race there is a certain rough proportionality between sensibility to pain and intellectual development. A case is recorded, for instance, of a Russian serf who, while splitting logs in a forest, was caught by the thumb in the crack of a large log from which the wedge had unexpectedly flown out. He tore himself free from his painful imprisonment, as a wild animal might have done, leaving the thumb in the log, with the long tendons of the forearm still attached to it. It is doubtful if a more civilized man could have subjected himself to this operation, even with the alternative before him of an indefinite imprisonment in the forest. The cruel tortures which savages inflict upon their friends and themselves, as in the initiation rites of the Mandan

* Abstract from the annual discourse, delivered July 10, 1896, by the President, before the Massachusetts Medical Society.

warriors, seem to be best explained on the supposition that their sensibility to pain is less acute than that of civilized races.

In the case of the lower animals the evidence of a low sensibility to pain is much more conclusive. Among our domestic animals the horse and dog are commonly regarded as standing nearest to man in intelligence and sensibility, and yet nearly everyone who has had much to do with these animals will recall instances of great indifference shown by them to what would be to us severe pain. A single illustration of this insensibility may suffice. A horse whose leg was badly broken was sentenced to be shot, but during the two hours which intervened between the sentence and the execution the animal limped about to graze, dragging the fractured limb dangling behind it in a way which would have caused a human being exquisite agony. It is evident, therefore, that it is entirely impossible to draw conclusions with regard to the sensations of animals by an effort to imagine what our own would be under similar circumstances. Our common human nature, which serves as a guide, though an imperfect one, in estimating the sufferings of other human beings, fails us entirely when we have to do with animals, and we are left to draw conclusions from cries, motions and other external signs of suffering. Now these external signs are apt to be misleading, for they only prove "that something is going on which the organism repels," but do not prove that the animal is conscious of what is going on. In other words, the cries and struggles of an animal whose skin is cut or burnt belong to that class of phenomena known as "reflex actions;" *i. e.*, they are movements having their origin in impressions made on the terminations of the nerves, and not in impulses coming from the nerve centers in the brain. They may be accompanied by consciousness, but consciousness, so far from being necessary for their production, acts rather to check and interfere with their manifestation.

We are all perfectly well aware that when the spinal cord of an animal has been divided in the cervical region, an impression made upon the nerves of the skin, either by a sharp instrument or a chemical irritant, will cause the animal to execute violent movements of a very definite character, adapted to remove the source of irritation and differing in no respect, except, perhaps in increased energy, from the movements of a perfectly uninjured animal. But in this case we know that the movements are not attended by consciousness, for by division of the spinal cord the channel by which impressions are conveyed to the nerve centers, whose activity is a nec-

essary condition of consciousness, is entirely obliterated. The movements are, in fact, no more indicative of suffering than are the convulsive flutterings of a decapitated chicken. We can speak with great positiveness upon this point, for the testimony of hospital patients suffering from injuries to the spinal cord shows clearly that violent reflex movements of the lower limbs may occur absolutely unattended by consciousness. It is, moreover, a matter of common experience that in certain stages anaesthesia consciousness may be entirely abolished, while the activity of the lower reflex centers remains unaffected. In such cases patients may struggle and scream during an operation, but subsequently declare that they have suffered no pain.

It is evident, therefore, that great caution must be exercised in drawing conclusions with regard to the sensations of animals from the external signs of suffering which they manifest when undergoing operations, and that the "spasm of agony" of sensational writers is in most cases much better described as a nerve-muscle reaction.

We have thus seen that for the production of a painful sensation three things are necessary:

First, the stimulation of a sensory nerve or its terminations.

Second, the transmission of the stimulus to the nerve centers whose activity is associated with consciousness.

Third, the response of these nerve centers to the stimulus thus received.

Pain may then be defined as the *consciousness of the excessive stimulation of a sensory nerve.* This definition excludes those cases in which the brain is narcotized or separated from the rest of the nervous system, so that there can be no consciousness of the stimulation of the nerve, however severe it may be, and also those cases where the stimulation of the nerve is moderate in amount and therefore gives rise to agreeable sensations. The precise point where the stimulus of a nerve ceases to be moderate and agreeable and becomes excessive and painful cannot be determined with precision, for a stimulation which is moderate for one individual will be excessive for another or for the same individual at a different time. The strong alcoholic liquor, for instance, which pleasantly titillates the throat of a drunkard will sear the delicate mucous membrane of the child unaccustomed to its use.

Having thus arrived at a definition of pain and noted that the phenomenon in man and the lower animals is similar in kind

though vastly different in degree, we recur to the original question: Have we a right, in studying the phenomena of life, to inflict upon animals whatever pain may be necessary for the attainment of our object? This leads us to consider the broader question, how far it is right that one individual should suffer for the good of another; and this again involves the still broader problem, how far the prospect of future good may compensate for present evil. A full discussion of these questions would carry us far beyond the limits of this discourse. For our present purpose it will be sufficient to note the fact that we unhesitatingly submit ourselves and subject those we love to physical suffering for the sake of future benefit which we think will outweigh the present pain. Nor is this deliberate choice of present evil for the sake of future good limited to those cases in which the evil and the good are both experienced by the same individual. The law of vicarious suffering, by which pain to one individual secures pleasure to another, is a law from whose operation we cannot escape if we would, and, however much we may at times rebel against it, a calm consideration forces us to recognize its stern beneficence. The law which bids us bear one another's burdens, and that which declares that the sins of the fathers shall be visited upon the children, tend powerfully to bind the human race together and contribute perhaps more than any other causes to the development of the moral sense. We see then that there is nothing repugnant to our moral feelings in the abstract idea that one individual should suffer for the benefit of another, and if we accept this principle, as indeed we *must*, when applied to two individuals belonging to the highest grade of sentient creatures, there is still less reason for rejecting it when the suffering individual belongs to a lower grade than the individual who is benefitted, since, for the reasons already given, the suffering, in this case, bears a smaller proportion to the benefits obtained than when both individuals are equally highly organized. Moreover, when the sufferings of the lower animals have, as a result, not a benefit to a single individual but an increase of human knowledge, the disproportion between the suffering and the benefit becomes practically infinite, for the suffering remains a constant quantity, while the benefit, since it accrues to the whole human race and through all time, is multiplied by an infinite factor.

Admitting, then, that there is no abstract reason why animals should not suffer for the benefit of man, it remains to be considered whether we have a "right to constitute ourselves administra-

tors of this law of vicarious suffering and to apply it to animals for our own interest." The right of man to inflict pain upon the lower animals for his own benefit has never been very distinctly formulated. Our relations to the wild denizens of the forest, field and stream are very largely an inheritance from those times when our savage ancestors disputed with the lower animals for the right to exist on the face of the earth. In fact, they do not differ materially, except in degree of complication, from the relation of the lion to the lamb or the hawk to the dove.

In the words of the author of the above mentioned work on "Physiological Cruelty," "It is generally admitted that we may chase and kill an animal, often necessarily with much pain, not because its life and liberty interfere with ours, but because its death will render our life more complete, perhaps in the most trivial detail. We kill them (without anaesthetics) not only that we may have food and clothing, but that the food may be varied and attractive and the clothing rich and beautiful. We subject them to painful mutilations in order to make them more manageable for service, to improve the flavor of their flesh, and even to please our whimsical fancies. We imprison them in cages and zoological gardens, to improve our knowledge of natural history, or merely to amuse ourselves by looking at them. It is abundantly clear that in all our customary dealings with animals we apply to them without scruple the law of sacrifice, and interpret it with a wide latitude in our own favor. * * * So far, the general principle of dealing with animals which is in a vague way accepted by most humane persons * * * seems to be that we may kill, inconvenience or pain them, for any benefit, convenience or pleasure to ourselves, but that the pain must be within moderate limits (of course undefined), and that it must form no element in our pleasure." Now, the point to be specially emphasized in this connection is that physiologists, in experimenting with living organisms, cause an amount of suffering utterly insignificant compared with that which animals are called upon to endure in other ways, and that the suffering thus caused is inflicted with a motive and with an expectation of benefit quite adequate to justify the infliction of a much greater amount of pain that even the most serious operations in the laboratory can be supposed to produce.

In this respect the physiologist stands, it seems to me, on higher moral ground than that occupied by most persons whose occupation leads them to sacrifice animal life. Compare, for instance, the

occupation of a sportsman with that of a physiologist. It is difficult to imagine how an animal such as a deer or a rabbit can be made to endure greater physical agony than in being hunted to death by hounds. It is hard to conceive of animal suffering more entirely out of proportion to the object sought and gained by it than that produced by the average sportsman whenever he fires a charge of shot into a flock of birds, since, for every bird actually killed, several more will probably be wounded, and escaping with broken wings, fall an easy prey to their enemies or perish from starvation. Yet we inflict this suffering, not because we need the animal for food, not because its existence interferes in any way with our own, not because we expect to derive any permanent benefit from its destruction, but simply, as the word "sport" implies, because we are in search of amusement, and the sufferings of the animal are incidentally associated with our enjoyment of the moment. It must not be supposed that I desire to bring the charge of cruelty against sportsmen, for, of course, the fact that the animal suffers pain forms no part of the pleasure of the hunter; nor do I overlook the great benefit which the sportsman derives incidentally from his pursuit in the acquirement of health, strength and skill. I merely wish to point out, first, that, as far as the charge of cruelty is concerned, the physiologist may claim the same exemption which is accorded to the sportsman, for, so far from enjoying the sufferings of the animals on which he experiments, it is his constant object to reduce those sufferings to a minimum; and secondly that, with regard to a justification for the infliction of pain, the advantage is on the side of the physiologist, for the desire to enlarge the bounds of human knowledge and to fix firmly the foundations of the healing art must be regarded as a higher motive than the wish to secure one's own temporary amusement, and moreover the proportion between the benefit obtained and the pain inflicted is much larger in physiological experimentation than in the vocation of the sportsman.

In this connection it is interesting to contrast the fate of the victims of science with that of similar animals living in a state of nature. In doing this we are struck by the vast amount of animal suffering which the laws of nature necessitate. The weak are inevitably the victims of the strong. The chain of destruction extends throughout the animal creation, and every link involves the death of victims under circumstances which, from a human point of view, seem those of revolting cruelty. The cat plays with the mouse, apparently enjoying its terror and distress. The butcher-bird

impales its living victims on the thorns of the locust tree, thus laying up in its hideous larder a store of food often far beyond its needs. The larger carnivora tear their living prey limb from limb. In fact, the relations of animals to each other are such as to fully justify, from a moral standpoint, an indictment for cruelty against nature herself. With regard to domestic animals the case is often not much better. The vagrant cur and the prowling cat lead a life of constant terror, eking out a miserable existence among piles of garbage, and dying finally, when physical strength fails, from sheer starvation. Compared with misery like this the fate of the chosen victim of science may well be regarded as enviable, for once within the laboratory precincts warmth and abundant food are assured, and, though the term of life is shortened, its closing scene is often absolutely painless, and is, in any case, likely to be attended with less suffering than a so-called natural death.

With regard to physiological experiments which involve operations of a painful nature upon living animals, it is desirable for us to ascertain as accurately as possible the amount of suffering thus caused. The first important fact to be here noted is that the great boon conferred upon mankind in the discovery of anaesthetics extends its beneficent influence over the animal world as well. Just as no modern surgeon ever thinks of performing a severe surgical operation without placing the patient under the influence of ether or chloroform, so no physiologist neglects to use an anaesthetic when performing a prolonged or painful experiment, except in those rare cases in which its administration would interfere with the result of the experiment. Even on the supposition, which too many sensational writers are prone to make, that a physiologist is absolutely regardless of the amount of suffering which he causes, he will still be compelled to use an anaesthetic for his own convenience in order to suppress the cries and struggles of the animal, which would otherwise disturb the adjustment of his delicate instrument and interfere with the mental concentration essential for the proper performance of his work. This very concentration of the mind upon the work in hand prevents, of course, any active feeling of sympathy with the animal experimented upon, but the same may be said of the surgeon who, however tender-hearted he may be, never in operating allows his mind to wander from the work in which his hands are engaged. Neither the one nor the other can be charged with cruelty or inhumanity.

In this connection it may be well to allude to the question whether curare, a drug much used by physiologists, is or is not an anaesthetic. This substance is the arrow poison of certain tribes of South American Indians, and has the property of paralizing the voluntary muscles. The earlier experiments of Claude Bernard on frogs, showing that sensory nerves are not affected by the poison, led him to the conclusion that an animal poisoned by curare preserves his sensibility to pain, but has lost the power of giving any sign of suffering. Strictly speaking, Bernard's experiments only show that the drug affects the sensory nerves and the spinal cord less readily than the motor nerves, while they throw no light on the question of the persistence of consciousness, but the fact that they succeed equally well after the removal of the cerebral lobes seems to exclude consciousness from any important participation in the phenomena. The arguments which have sometimes been used to sustain the proposition that curare increases the sensibility to pain would prove also that small doses of morphia have the same effect, whereas we know that morphia in small doses diminishes and in larger doses annihilates the sensibility to pain. Thus the weight of physiological evidence seems to be in favor of the view that curare may be to some extent an anaesthetic, though it is not employed by physiologists for that purpose. Psychological evidence pointing in the same direction may also be urged, for, on the theory promulgated and ably defended by Prof. William James, that all emotions are but the conscious recognition of the reflex actions produced by the exciting cause of the emotions, it seems evident that so much of the substratum of the feeling of pain as is dependent upon the reflex contraction of voluntary muscles must, in cases of curare poisoning, be absolutely wanting.

Of the possibly painful physiological experiments which we are now considering, it has been calculated by Prof. Yeo that 75 per cent. are rendered absolutely painless by the use of anaesthetics; but it must be admitted that the giving of an anaesthetic to an animal is not the same agreeable operation that it is to a human being. The animal does not understand the reason why it is compelled to breathe a vapor which is gradually depriving it of its consciousness, and usually struggles against the administration of it, thus rendering some sort of forcible confinement necessary. The inconvenience thus occasioned to the animal is, of course, overbalanced in the case of prolonged or serious operations by the exemption from subsequent suffering. When, however, the operation is of a

trifling character it is doubtless more merciful to the animal to dispense with the use of anaesthetics. For the complete understanding of this portion of the subject, it should be mentioned that a large portion of the animals thus rendered insensible for physiological purposes are killed after the experiment has been performed and before the effect of the anaesthetic has passed off. Where the object of the research is to observe the subsequent effect of the operation, it is, of course, necessary to allow the animal to recover from the anaesthetic and to endure whatever pain may be connected with the healing of its wounds. This has, however, been reduced to insignificance by the modern methods of antiseptic surgery, the discovery of which was led up to by physiological experiments, and the benefits of which are now experienced by the brute creation as well as by the human race.

Accepting Prof. Yeo's estimate that seventy-five per cent. of the possibly painful physiological experiments are rendered absolutely painless by the use of anaesthetics, it remains to be considered how much suffering attends the remaining twenty-five per cent. of these experiments; and here it is important, in all discussions of this subject, to correct a rather prevalent popular notion that a wound is painful in proportion to its depth. The fact is, however, that sensibility to pain is, in a healthy body, confined almost wholly to the surface. A consideration of the function of the sensory nerves shows us why this should be the case, for these nerves are distributed only to points where under normal circumstances they can receive stimulation, and thus serve to bring the organism into relation with the outer world. Pain, caused by excessive stimulation of a sensory nerve, is the sign that the integrity of the body is threatened by some external agency, and at this signal the body reacts consciously or unconsciously to ward off the threatened danger. Now external agencies can act upon the body only at the surface. Hence sensory nerves distributed to internal organs would have no *raison d'etre;* and, in the wise economy of nature, we find, accordingly, that they do not exist. The apparent contradiction to this statement furnished by the painful sensations, *e. g.*, cramps and colics which we sometimes experience in our internal organs, are really illustrations of the same general law, for the pain in this case is the indication of some *morbid* action of an organ, and is usually the sign that rest is necessary to enable the organ to recover its normal condition. It is a matter of common experience, therefore, that the cutting of the skin is the only really

painful part of even quite serious operations. As the knife divides the deeper organs no pain is felt, except indeed when a sensory nerve trunk is divided, which operation is attended by a momentary flash of pain. Even the brain, the seat of consciousness itself, is no exception to this rule, for its substance may be cut and operated on in various ways without causing the slightest pain. It is evident, therefore, that in a large proportion of the actually painful experiments performed in physiological laboratories the pain must be of the briefest duration, since it is almost wholly confined to the preliminary incision. It must also be borne in mind that a large class of experiments consists in the introduction of drugs under the skin, an operation about as painful as vaccination or as a subcutaneous injection of morphia. Bearing these facts in mind we are well prepared to accept Prof. Yeo's estimate, that of the twenty-five per cent. of actually painful experiments, twenty per cent. are about as painful as vaccination, four per cent. about as painful as the healing of a wound, and one per cent. as painful as an ordinary surgical operation performed without anaesthetics.

I have thus sought to set before you the material for forming a judgment with regard to the amount of animal suffering which the practice of experimental physiology involves. It remains for me now to speak of the value of the discoveries thus made, or, in other words, to present to you briefly the evidence of the debt owed by the practicing physician of the present day to the physiologist of the past. We shall then be in a position to answer the question whether on the whole "vivisection pays." To enumerate all the discoveries that have been made in physiology by means of experiments on animals would be utterly impossible within the limits of this discourse, for there is hardly a single organ of the human body whose functions have not been investigated and explained in this way. It will suffice at this time to call your attention to a few of the more important physiological discoveries which form the groundwork of our knowledge of the human body and to ask you to imagine, if you can, what would be the condition of the healing art if these discoveries had never been made.

To begin with, let us consider the circulation of the blood, the discovery of which bears somewhat the same relation to medicine that that of the law of gravitation bears to physics. It is well known that the ancients believed the arteries, as their name implies, to be tubes containing air. When Galen, in the second century of our era, studied the arteries in living animals, the fact that

they carry blood was, of course, apparent. The circulation of the blood was, however, far from being made out. In fact, it was not till the beginning of the seventeenth century that Harvey, gathering up the learning of the time, contributed by the great Italian teachers, Vesalius, Eustachius, Fallopius, Fabricius of Aquapenbente, and others, and making important additions of his own (as he himself says) "by frequently looking into many and various living animals," was finally able to promulgate the true theory of the circulation of the blood. Since the time of Harvey our knowledge of the conditions under which the blood circulates has been greatly extended, and always by means of experiments upon living animals. The pressure which the blood exerts upon the walls of the vessels in different parts of its course has been carefully measured. The fact that its white globules can pass through the vascular walls into the tissues outside has been clearly demonstrated, and forms, in fact, the basis of the modern theory of inflammation. The influence of the nervous system in controlling the size of the channels through which the blood circulates, thus regulating the nutrition of the tissues, the activity of the organs and the distribution of the heat, has been studied by a host of observers, and is, indeed, one of the most fruitful fields of modern physiological research. It is difficult to imagine what the practice of medicine would be without this knowledge, which has been wholly obtained by experiments on living animals and which is now the common property of educated physicians. It has, indeed, been very pertinently asked: "How will those earnest anti-vivisectionists, who, like Miss Cobbe, prefer to 'die sooner than profit by such foul rites,' provide themselves with a medical attendant warranted ignorant of the circulation of the blood?"

The direct benefits received from animal experimentation are, perhaps, more obvious in surgery than in the other departments of medicine. The proper mode of applying ligatures to arteries and the antiseptic treatment of wounds have reached their present stage of perfection largely through experiments on the lower animals. To give you a vivid idea of the privileges which we are now enjoying, I will ask you to listen to Ambros Pare's description of an amputation as performed in his time: "I observed my masters, whose method I intended to follow, who thought themselves singularly well appointed to stanch a flux of blood when they were furnished with various store of hot irons and caustic medicines, which they would use to the dismembered part, now one, then another, as they

themselves thought meet, which thing cannot be spoken or but thought upon without great horror, much less acted. For this kind of remedy could not but bring great and tormenting pain to the patient, seeing such fresh wounds made in the quick and sound flesh are endured with exquisite sense. * * * And verily, of such as were burnt, the third part scarcely ever recovered, and that with much ado, for that combust wounds with difficulty come to cicatrization; for by this burning are caused cruel pains, whence a fever, convulsions, and oftentimes other accidents worse than these. Add hereunto that, when the eschar fell away, ofttimes a new haemorrhage ensued, for stanching whereof they were forced to use other caustic and burning instruments. * * * Through which occasion the bones were laid bare, whence many were forced, for the remainder of their wretched life, to carry about an ulcer on that part which was dismembered; which also took away the opportunity of fitting or putting to an artificial leg or arm, instead of that which was taken off."

Let us now contrast this ghastly picture with the methods of a modern amputation. The patient is first made unconscious by the use of ether or chloroform. The blood vessels of the limbs are then emptied by means of an elastic bandage. Hardly a drop of blood is shed in the amputation itself; the divided arteries are firmly tied and the wound, treated antiseptically, heals with little or no pain. At every step in the process which has led to this brilliant result experiment has been the guide. Various technical details of the method remain still to be worked out. It is this beneficent work which anti-vivisectionists seek to abolish.

I will allude to but one other benefit conferred upon suffering humanity by scientific experiment involving the sacrifice of animal life: The therapeutic use of anti-toxine, though still in its infancy, shows by the unimpeachable records of hospital practice that the physician has now within his grasp the means of successfully treating one of our most dreaded diseases. The anxiety, almost amounting to despair, with which a physician formerly approached a serious case of diphtheria, has given place to a feeling of well grounded hope of a favorable result. Who can estimate the burden of terror and distress thus removed from the anxious watchers by the bedside, and who will dare to say that the boon has been dearly purchased by the lives of some thousands of guinea pigs?

Let us now briefly review the points over which we have already passed. We have seen, in the first place, that pain is a purely sub-

jective phenomenon, the sensibility to which differs very much in different individuals and is in the lower animals reduced apparently much below that of the least sensitive human beings, and that, moreover, the external signs of suffering are apt to be misleading, unless the conditions under which these signs are made are well understood, a knowledge which can be acquired only by careful physiological study. We have seen, in the second place, that pain is only relatively an evil, that we submit to it ourselves and subject others to it for the sake of subsequent advantages which we consider sufficiently important. Thirdly, we have seen that our relations to animals are such that there is no well recognized objection to our causing them very great suffering for the sake of very slight benefits to ourselves. In this matter there is, of course, great room for improvement. The practical question always is "how much suffering may we inflict on an animal for the sake of how little benefit to ourselves?" In the progress of civilization there is a constant tendency to draw the line more and more in favor of the animal, but when we remember how much opposition there was, within a few years, arrayed in this State against the passage of a law to abolish pigeon shooting we cannot flatter ourselves that we have, as yet, reached any very advanced humanitarian standpoint. It is certainly no very extravagant concession to the rights of animals to enact that they shall not be set up as living targets at a shooting match, when glass balls thrown into the air will answer the same purpose. In forming and fostering a public opinion which demands a greater consideration for the brute creation, the societies for the prevention of cruelty to animals have played an important part, and their work would doubtless be still more effective were they in the habit of making more frequent applications of the results of physiological research to the problems of animal life. By the efforts of these societies and by the general growth of humane sentiments in the community, we may expect that a larger and larger prospective benefit will be demanded as a justification for the infliction of pain upon animals. To this raising of the requirements of humanity physiologists will be certain to offer no objection, provided the same rule is applied to all occupations involving pain to animals; for it is evident, I trust, from what has been said, that a standard so high as to be practically inapplicable to the daily affairs of life will still leave a wide margin for the carrying on of physiological research. A questionable practice cannot of course be justified by demonstrating that another and still less

justifiable practice exists, but it may be fairly urged that, while practices are permitted which cause great suffering to animals with only incidental benefits to mankind, "it is irrational folly," to quote a writer in *Nature*, "to waste the energy of humanitarian feeling in a warfare against the only kind of pain-giving practice which is directed toward the mitigation of pain, and which has already been successful in this its object to a degree out of all proportion to the pain inflicted."

Enough has been said, I trust, to demonstrate the expediency of permitting physiological research to go on unchecked, and even of encouraging it, in every possible way, as the only legitimate basis of scientific medicine. Before leaving the subject, however, it is well to notice that, whatever restrictions be imposed on the physiologist working in his laboratory, the advancement of medicine by experiment will be certain to go on. Agitation cannot check it. Legislation cannot prevent it. Once admit, what no one thinks of disputing, that physiological phenomena are chemical or physical in their character, and the position of physiology among the experimental sciences is a matter of necessity. All that legal enactments can do is to determine to some extent who shall be the experimenters and who the victims of the experiments. Shall practicing physicians grope blindly in search of methods of treatment when chance brings disease under their observation, or shall men of science, systematically studying the nature and results of morbid processes in animals, point out to the practitioner the path to be followed to render innocuous the contagion of our most dreaded diseases? In illustration of this point, permit me to quote a few lines from Dr. John Simon's address on State Medicine: "The experiments which give us our teaching with regard to the causes of disease are of two sorts; on the one hand, we have the carefully pre-arranged and comparatively few experiments which are done by us in our pathological laboratories, and for the most part on other animals than man; on the other hand, we have the experiments which accident does for us, and, above all, the incalculably large amount of crude experiment which is popularly done by man on man under our present ordinary conditions of social life, and which gives us its results for our interpretation. * * * Let me illustrate my argument by showing you the two processes at work in identical provinces of subject-matter. What are the classical experiments to which we chiefly refer when we think of guarding against the dangers of Asiatic cholera? On the one side

there are the well-known scientific infection experiments of Prof. Thiersch, performed on a certain number of mice. On the other hand, there are the equally well-known popular experiments which during our two cholera epidemics of 1848-49 and 1853-54 were performed on a half a million of human beings, dwelling in the southern districts of London, by certain commercial companies which supplied those districts with water. Both the professor and the water companies gave us valuable experimental teaching as to the manner in which cholera is spread. * * * Now, assuming for the moment that man and brute are of exactly equal value, I would submit that, when the life of either man or brute is to be made merely instrumental to the establishment of a scientific truth, the use of the life should be economical. Let me, in that point of view, invite you to compare, or rather to contrast with one another, those two sorts of experiments from which we have to get our knowledge of the causes of diseases. The commercial experiments which illustrated the dangerousness of sewage-polluted water supplies cost many thousands of human lives; the scientific experiments which, with infinitely more exactitude, justified a presumption of dangerousness cost the lives of fourteen mice."

We see, then, that in one way or another experiment must form the basis on which medical science is to be built up. The question for us to decide is, "Shall these experiments be few, carefully planned, conclusive, economical of animal life, or shall they be numerous, accidental, vague and wasteful of human life?" I think in settling this question we may safely take for our guide the words of Him who said, "Ye are of more value than many sparrows."—*Science*, July 24, 1896.

ICELAND offers such exceptional advantages and opportunities to the sportsman, the tourist, the naturalist, the mountaineer, and the seeker of health, that, in no distant future, it is destined to become the tourist field of Europe. The glaciers of Switzerland, the fjords, the salmon rivers, and the midnight sun of Norway are all there, and, moreover, the volcanoes, grottoes and salfataras of Italy, on a grander scale; the pure and clear atmosphere of Italy, the mineral springs of Germany, and the geysers, or hot springs, of the Yellowstone Park, are all there. Nowhere has nature been so spendthrift in assembling wonderful phenomena on one spot.

EFFECT OF HARD TIMES ON MORTALITY.

The publication of the transactions of the Actuarial Society at its last meeting (*Insurance Monitor*) furnishes some interesting remarks, by Mr. Charlton Lewis, concerning the influence of hard times on the mortality of the well-to-do class who are so largely the subjects of insurance. Mr. Standen had presented a paper on the subject, in which he called attention to the possible danger of concentrating insurance on this class in view of its peculiar susceptibility to reverses of fortune. The nervous strain which comes from anxiety tends to induce nervous and other complications which shorten life. On this point Mr. Lewis says:—

"If this class in the community, after the long experience which life insurance companies have had, still constitutes a preferred class, there must be some reason for it. The first consideration, then, in discussing the extent and effects of nervous disease, growing out of financial anxiety, in this particular class, should be directed to the question why they are preferred, and whether the grounds on which they are preferred are sufficient to counterbalance any special liability to this class of disease. Now, it seems to me that the recognized preference for this class of risks depends on the known truth that they form precisely that part of the community which, by greater vitality, physically, mentally and morally, have fought their way to the front rank of society and have justified their claim to be considered as preferred. They are exceptionally able to bear the burdens of life, and are, therefore, especially welcomed in life insurance companies.

"Now, it is certainly a question, as Mr. Standen suggests, for very earnest consideration, whether this ground of preference is sufficient to overcome the risks resulting from the financial anxiety. There is no sufficient evidence that those who have proved themselves able to bear the strain and to undergo the burdens of life, above the rest of their fellows, do suffer more from the strain of hard times than those who have not shown their capacity in this way. I would seek for light on this matter, but I question whether, as a fact, the strain of hard times, as affecting mortality, is more severely felt among the class of men who are foremost in business

enterprises than it is among more ignorant men, among those whose interests are smaller, among those whose position in life is in all ways narrower. And until it is conclusively proved that this is the case, there is surely no presumption that excessive risks are incurred by concentrating the force of our agencies among the class which we have recognized as preferred. Other things than hard times produce anxiety in human life. The whole progress of civilization, throughout the history of modern times, is a progress from a period in which anxiety and apprehension with regard to the future characterize the efforts of the ordinary man toward a time when comfort reigns in society and when social organization and general wealth are such as to relieve the average man from extreme apprehension for the future of himself and his family.

SANITARY CARS.—The study of bacteriology shows how liable disease is to be communicated in traveling by the presence of micro-organisms.

In the laboratory of the Imperial Health Board of Germany the dust gathered from the floors, walls and seats of cars has been subjected to examination. One hundred and seventeen animals were inoculated with dust taken from forty-five compartments and twenty-one different passenger cars. Part of these died very soon of various contagious diseases before they had time to develop consumption; of the rest, four killed four weeks after inoculation, three had tuberculosis. These three were inoculated with sleeping car dust taken from the walls, cushions and ceilings. Bacteria at the rate of 78,800 per square inch were found on the floor of a fourth-class carriage, and 34,400, 27,000 and 16,000 per square inch on the floors of the third, second and first-class carriages. The sanitary car should be constructed and furnished so that it could be thoroughly disinfected every day, by washing it out with a hose-pipe from end to end, ceiling, walls and floor, without injury to the furniture. Carpets should give place to hardwood floors, and woven steel wire be substituted for the silk and worsted covering of the seats, and the bedding be subjected, before being used again, to thorough disinfection. It would require but very little ingenuity to perfect a system which would prove of inestimable advantage to the health of the traveler.—*Hot Springs Medical Journal.*

THE OLDEST CIVILIZED MEN.

By E. D. Cope.

Recent explorations in Babylonia have given us much information as to the character and customs of the oldest civilized people of whom we have any knowledge. * * *

They built temples and palaces on huge plateaus constructed of brick. They carved statues and vessels and made pottery. Especially they left records of their history on numerous cylinders and tablets of clay, of which many have been preserved. They formed organized armies armed with spears, bows and shields. What relation did these people bear to the people of Nineveh whose monuments were revealed to Europe by the labors of Rawlinson, thirty-five years ago? Heuzey declares them to have been older than the Assyrians, and this position is proven by Hilprecht, who believes their earliest king whose name is preserved in the records of Nippur, Enshagsagana, to have lived 4500 B. C. Many kings intervened between him and Sargon I. with whom Assyrian history for a long time commenced. These people were predecessors of the Assyrians of Nineveh, and gave them their cuneiform characters, but they differed from them in customs, and to some extent in language. One marked difference of custom was the fashion of shaving the hair from all parts of the head excepting the eyebrows. Everyone knows on the contrary that the Ninevites took great pride in their hair, and that both on the calvarium and face it was curled and arranged with great care. The figures also show that the Sumerians did not practice circumcision as most Semitic and some other races have done.

The shaving enables us to get a pretty good idea of the form of the head and face. The skull is oval, rather long and flat, and probably mesaticephalic. The jaws both upper and lower, are remarkably small, giving an extreme orthognathic type. The nose is remarkably long, prominent and curved, with a good bridge. The eyes are large, horizontal, and not bridled. The cheek-bones are in a few other unshaved portraits, the beard is abundant, and the ends of the hair of the calvarium curled up. The figure of the body is robust, broad and rather short. The extensor muscles, i. e., gluteus, quadriceps, and gastrocnemius are well developed.

From the above it is evident that no thought of Mongolian (= turanian) or Ethiopian relationship can be admitted. After a study of some of the least characteristic heads broken from statutes, M. Heuzey remarks, that "the evidence is not sufficient to demonstrate the existence of Turanians in Chaldea." These people are clearly of the great Indoeuropean subspecies of man (*Homo sapiens caucasicus*), so that the question reduces itself to one of the determination of their race position. Are they Aryans, or Semitics? using these two terms as covering all the forms of the greater subspecies to which they belong. In the determination of these minor divisions of man, physical characters begin to fail us. We can only say that if the term Aryan is used for the western peoples generally, the Sumerians differ from them in the direction of the Semitics by their large oval eyes and hooked noses. On the other hand, the small and delicate jaws are not features of Semitic peoples. But the people of Persia or Iranians, hold very much this intermediate position between the two peoples. We scarcely know the shape of the jaws and chins of the Ninevites for they are never shaved. So far as the visible features go they resemble the Sumerians. It is on all grounds to be supposed that the people of Nippur and Tel-lo are the primitive Aryans of the Iranian or Persian race, and ancesters of the Ninevites.

In any case it is evident that we have in these most ancient of civilized people, a type of man as high as any that has since appeared from the point of view of physical evolution. The extreme orthognathism; the prominence of the nose; the reduction of the cheek bones, the full beard, and the well developed extensor muscles of the leg, prove this. *Homo sapiens caucasicus* had reached his full characters on the plains of the Euphrates 6400 years ago.

The relation of time and race of the oldest civilizations to the prehistoric peoples, is a problem which will doubtless be solved in time. Did the Neolithic people exist in Europe contemporaneously with the Sumerians of Chaldea? The only light that can be thrown on the question is as follows: The Sumerians were not stone people, but bronze people. They had no knowledge of iron. No search has been made for the remains of animals which were their contemporaries, but several species are clearly represented on their sculptures. The most common are the lion and the ox (*Bos taurus*, not the buffalo). There is a good drawing of a gazelle in the collection of the University of Pennsylvania. The goat and sheep represented are species now existing in Persia. The goat is near the *Capra aegagrus* of the mountains of East Persia, the an-

cestor of the domestic goat; and the sheep is apparently the wild sheep of the same region *Ovis vignei.* So from a paleontological point of view, the Sumerians were quite modern.—Abstract from article in *American Naturalist* for August, 1896.

MEDICAL EXCERPT.

By T. P. Corbally, A. M., M. D.

Increase of Volume of the Liver.—In a case of hypertropic cirrhosis, M. Hannot has shown (Le Progres Medical, July 25) to the Societe des Hopitaux that it depends on a two-fold cause.

In one case an abnormal quantity of fibrous tissue is produced in the liver; in the other hepatic ridges become hypertrophied in certain places and are found to act as in nodular hepatitis. In an autopsy made recently in the case of an alcoholic subject in his service, he was able to determine the fact that a certain number of the lobules presented marked irregularities, the hepatic cells were greatly modified. This is usually an indication of a process of regeneration. It seems due to a hyperplasia due to the formation, sometimes of normal lobules, sometimes to lobules the cells of which are modified by flexible fibres. This process is in some cases more intense than in others. That seems to depend on an idiosyncrasy of the cell which reacts differently under different circumstances.

M. Claude reported the case of a young man 25 years of age who was brought to the hospital in an almost comatose condition. The rectal temperature was 33°.8. Active remedies were applied and the temperature soon rose to 35°.8. Great weakness existed, and the pulse was almost imperceptible. The following day the general condition was very much improved, the temperature rose to 37°. The patient was able to speak and said that he first suffered from intoxication caused by acid vapors. A subicteritic condition that is rarely found united with albuminuria existed and hypoazoturia, stoats without color, and liver painful. During the following days the temperature went up, the urine was passed in normal quantity and a marked improvement was found in the biliary pigments. After a time the patient recovered, but the liver remained enlarged. It is probable that in this case the disturbance was of hepatic origin, due to a profound alteration in the liver under the influence of acids.

THE HEMOSTATIC ACTION OF GELATIN has been pointed out by M. P. Carnat as mentioned in the Gazette Hebdomadaire. The arrest of hemorrhage may be insured by the use of about a 5 or 10 per cent. solution of gelatin in water. Many cases of severe epistaxis of metrouhagia, etc., have been checked in this way.

Although the chloride of calcium has much greater coagulating properties, the effects resulting from its use do not seem to be so satisfactory as that from the gelatin.

THE FUNCTIONS OF THE THYMUS GLAND have been the subject of experiments on frogs by M. M. Abelous and Billard for the purpose of establishing their importance.—Gazette Hebdomadaire, 26th July. The thymus has a very important influence in the function of nutrition. It is an organ indispensable in animal life. The disturbance produced in the economy by their removal seems to depend on an intoxication by substances which are as yet unknown and which, in the normal condition, is nutralized or destroyed by the thymus.

The removal of the thymus is followed by certain death, in four or five days, or at the longest in from twelve to fifteen. Death is preceded by disturbances of various kinds:

(*a*). Dynamic disturbances (muscular weakness, inability to resist fatigue, paresis).

(*b*). Local troubles. (Rapid discoloration of the skin; ulcerations and sphacelus.)

(*c*). Alterations of the blood. (Hydremia, general infiltration of the tissues, increase in size of the red corpuscles, diminution of their number, increase in the number of the leucocytes.)

The removal of a single thymus is sometimes fatal; most frequently, however, the animal survives and the remaining thymus becomes greatly hypertrophied and its removal is rapidly followed by death.

These results seem to depend upon a kind of auto-intoxication, for the blood, the lymph or the serum of a dying animal injected into another animal that has been recently operated upon greatly shortens its life and rapidly causes paresis.

THE COAGULATION OF THE BLOOD.—M. Gley has found that injections of peptone 0.50 centigrams to each kilogram of the animal weight caused the death of dogs. The autopsy showed the coagulation of the blood in the vessels, the aorta, the pulmonary artery and also in the heart.

HYSTERIA AND PALUDISM.—M. Lemoine presented to the Societe Medicale des Hopitaux—La France Medicale, 31st July—a patient without any hereditary taint, who, when in Tonquin, had a severe attack of marsh fever. Sometime afterwards he was attacked with hysterical symptoms, consisting of hiccough and troublesome eructations, accompanied with abdominal meteorism. The attacks came on very irregularly and lasted from ten to fifteen minutes. He has never had any severe attacks accompanied with convulsions, but there is a complete hemianesthesia of the right side with diminution of the field of vision. On a line with the hepatic region, there is a well marked hysterogenic zone; when pressure is made over this point hiccough is produced and also a marked tympanitic condition. The liver is large and much congested. M. Lemoine thinks that this hysterogenic zone is connected with the original affection which was the cause of the nervous troubles.

M. Hayem related the case of a young girl in whom an attack of hysteria was produced by the introduction of a tube into the stomach; this patient had also a gastric zone which was the seat of the hysteria.

THE OIDIUM ALBICANS, as a pathogenic agent—Gazette Hebdomadaire, 19th July—continues to be the subject of very interesting observations by M. M. Charin and Ostrowski; the toxic matters secreted by the mushroom are unusually virulent.

The Oidium Albicans takes also an important part in the process of auto-infection, usually attributed to visceral deterioration, especially rhenal and intestinal, which cause a certain amount of retention of the internal toxic agents. The phenomena observed as (mezasis, convulsions, etc.), the examination of hystological specimens and the toxic conditions resulting from the serum, the very reverse of that of the urine, establish the reality of this process.

The parasite acts also in addition to this directly, mechanically, and the changes are especially noticeable around the centre of the infection; there they are undoubted facts, such that nothing can change; the extension also exists; it may be sometimes more limited—that is a question of extent—than in bacterial affections, at least in the conditions which we are here considering as regards an equality of virulence in relation to similar media.

If the conditions are changed, as in all similar cases, the results are necessarily changed.

EDITOR'S TABLE.

SANITARIAN, SEPTEMBER NUMBER, 1896.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

MICROBES AND GOOD BUTTER.

Bacteriology has been a wonderfully progressive science during recent years, insomuch that sensible readers generally, scarcely less than practical sanitarians, have learned that all bacteria are not bad; that indeed, most of them are harmless and that some species are exceedingly useful and sanitary. Nevertheless we find that their presence in relation with wholesome foods is too frequently interpreted as mischievous and indicative of infection. We have before us at the time of this writing a pretentious analysis of the investigations of Prof. Conn and others, with regard to the presence of microbes in milk, cream and cheese; deducing the conclusion that all such microbes are dangerous! Then follows an account of the alleged danger of swallowing the skins of fruits, verified by laboratory experiments. "A young man in whose stomach fluid no microbes whatever were found after a breakfast of sterilized food, was given a quantity of unwashed grapes, which he ate skin and all. Examination of the stomach fluid showed more than five hundred thousand microbes for each fluid ounce." Doubtless salutary microbes, fulfilling their function of promoting the digestion of the grape skins. And attention is invited to "the fact that the bloom of the peach is a luxuriant growth of microbes, which find in the stomach most favorable conditions for growth and development, thus causing decay of the fruit before it can be digested." And this is alleged to be the reason why some people cannot eat raw fruit, and the conclusion is that all raw fruit should be thoroughly washed and the skin removed before it is eaten." Still more extravagant are the recently published experiments of M. Lauenstein, of Hamburg, with regard to the bacteria that cling to the skin, so numerous and so tenacious that, in surgical practice before proceeding to perform an operation he advises a disinfection of the surface of the body by washings with ether, alcohol, chlorine, corosive sublimate, etc.; apparently regarding all bacteria as disease germs, while in reality they are exceptional. The *health* bacteria germs whose function it is to promote health in one way or another, by destroying disease germs, or overcoming the condi-

tions which sustain them; by purifying water and food; by promoting digestion, etc., are doubtless a millionfold more numerous than disease germs. And it is pleasant to reflect that the functions of such are beginning to be recognized and utilized.

Butter affords an apt illustration. The U. S. Patent office has recently issued a patent to Vilhelm Storch, a citizen of Denmark, for "certain bacterial cultures" which are designed for use in the artificial flavoring of butter. Added to fresh cream, these microscopic organisms multiply in incalculable numbers, and give to the substance the peculiar taste-quality that is desired by people who eat butter. In Denmark dairying is conducted on scientific principles, and in that country bacterial cultures have come into general use in the creameries. Already such cultures have been placed on the market in the United States, and small quantities of them are obtainable by farmers, put up in bottles and hermetically sealed. It used to be imagined that the pure aromatic flavor peculiar to fresh butter of specially fine flavor resulted chiefly from the feed consumed by the cows, and that the great difference in quality between winter butter and summer butter was due to the difference between the winter feed and the fresh grass feed of the summer. This idea proves to be wholly a mistake. The difference is due to the varying species of bacteria that find their way into the cream.

This fact having been discovered, the next thing obviously was to isolate the bacteria that produced the proper flavor and to make cultures of them—i. e., multiply them in beef tea, gelatine, or some other material on which they would feed. It is found that a very small quantity of such a culture, introduced into a pan of cream, will effect the desired result, the good microbes driving out the bad ones. Thus it is easily conceived how valuable to the dairy farmer is a supply of a proper culture, by which his butter product may be made of a firstrate and uniform quality. To-day he is able to buy the cultures, either in a liquid or in a dry state, in hermetically sealed bottles. The sealing is all-important, inasmuch as the air is alive with bacteria of all sorts, and none not wanted must be admitted.

Apropos to the foregoing, one of the most significant creditable showings made by the export trade of the United States is in the excellence of the butter exported. This appears by the recently published results of testing butter from other countries by the British Board of Agriculture, undertaken about a year ago and kept up until February last, analyzing no less than 995 samples, taken

from twelve different countries, counting Norway and Sweden as one. According to these tests the twelve countries divide themselves equally between the pure and the adulterated, the sheep and the goats, and in the purity class the United States leads. It is fairly entitled to this priority, because there were more samples taken from our butter than from any one in the same class. That Argentina, with only four samples, should show no adulteration was not so remarkable certainly as that the United States did not, with sixty-three samples. The results may be seen in their relations to each other more readily if published in parallel columns, thus:

Adulterated.	*Unadulterated.*
The countries in whose products adulterated specimens were found are as follows: Belgium, 5 samples, 1 adulterated; Denmark, 182 samples, 8 adulterated; Germany, 154 samples, 43 adulterated; Holland, 250 samples, 66 adulterated; Norway and Sweden, 109 samples, 2 adulterated; Russia, 49 samples, 5 adulterated.	The countries contributing samples among which no adulterated specimens were found are: Argentina, 4 samples; Austria, 57; Canada, 39; France, 62; New Zealand, 21; United States, 63.

It will be seen from this that 34 per cent. of German butter is adulterated, more than a third; 25 per cent., or a quarter, from Holland. Even Denmark, England's favorite dairy country, shows nearly 5 per cent. of adulteration. It may occasion some surprise that Argentina figures in either list, but it is not likely that it will ever be a very important factor in the butter market of the world. The vast plains of the Argentine Republic could raise live stock for almost nothing, but range cattle have never produced much butter, and even if produced it would be hard to transport it in good condition, for it has to cross the equator in going to market. These four samples might be pure and still be unfit to eat. Frowy butter is no more palatable for being free from adulteration. The most important feature to Americans is that our butter was found without any impurities.

It may be remarked that this analysis was solely confined to exports to Great Britain, but what is true of the butter exported to that country is equally true with regard to all the rest. And the United States has great reason to take solid comfort in the high testimonial to the purity of our butter, for that is what it really amounts to.

CANNED FOOD BEFORE THE LAW.

Mr. Justice Stover of the Supreme Court, sitting in Brooklyn, has recently decided an interesting question arising out of the sale of a can of prepared salmon. The salmon was sold without any express warranty as to its condition. It turned out to be unwholesome and unfit for human consumption; the purchaser and others who ate of it were made violently ill; and a suit was brought to recover damages on the ground that, although there was no express warranty, there was an implied warranty on the part of the seller that the salmon was fit to eat.

The Court determined otherwise, holding that the doctrine of implied warranty had no application to such a case.

In Blackstone's commentaries there is a general statement, to which Judge Stover refers, to the effect that in contracts for provisions it is always implied that they are wholesome; but it is probable that this proposition is limited to those cases in which the seller has a better opportunity than the buyer to inform himself concerning the real condition and wholesomeness of the article of food sold. Thus it is entirely reasonable to say that a man who sells a quarter of beef from one of his own cattle slaughtered by himself is bound at his peril to know that the meat is sound and suitable for food; but it is quite another thing to say that the mere vender of provisions, who has had nothing to do with preparing them, and who sells them in the unbroken packages in which they come into his hands, thereby engages that they shall turn out to be wholesome when opened.

In the latter case, according to Mr. Justice Stover, the reason for assuming the existence of an implied warranty fails, inasmuch as the seller has no sources of information or knowledge which are not equally accessible to the buyer. "In the progress of affairs, the manner of preparing and selling food has come to that condition that everybody purchasing ought to be presumed to know that the retail merchant who sells to the consumer food sealed in cans, and with which he has no connection other than as conduit between packer and consumer, has no superior means of knowing the contents of the can than the purchaser has, and in that event, if the purchaser desires to protect himself, he may ask for an investigation at the time of purchasing or he may get an express warranty as to the quality of the goods." Otherwise, if this view of the law is correct, the purchase of canned food is made at the buyer's own risk.

Of course, all that we have said, together with the entire argument of Judge Stover in favor of this conclusion, is based upon the assumption that the seller is actually ignorant of the true character of the goods and has no reason to suspect that they are unwholesome. The concealment even of reasonable grounds for suspicion would doubtless render him liable to a purchaser who suffered injury.

The daily consumption of canned meat and vegetables in New York and Brooklyn is so large that this decision affects the interests of a very considerable portion of the inhabitants of both cities. Fortunately, however, we believe the cases are comparatively few in which canned food has proved to be actually deleterious. Unwholesomeness is the rather rare exception, while excellence is the rule.

"SLOPPY WEATHER CLUB" is the short for a new dress reform adapted to the rainy-day outings of sensible women. It is described by Annette Crawford—a health culture club woman—as having existed in Orange, N. J., for several years, where those who belong to it, having occasion to go out in rainy weather, wear dresses sensibly short and reasonably plain. While these women have made a notable impression in their neighborhood and have set a good example for their sisters, their club is an exclusive one, and they have not tried to make recruits. To the Health Culture Club, therefore, belongs the honor of being the pioneer in organized rainy day dress reform.

She makes complimentary reference to the Brooklyn Health Club's effort to introduce a new "common sense" costume for the street, and confidently predicts that its adoption will be a memorable event in the history of emancipated women.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

ALABAMA.—*Mobile*, 31,076: J. A. Abrahams, M. D., Health Officer, reports for July: Deaths, 78—27 under five years of age. From typhoid fever, 5. Annual death rate, 29.35.

CALIFORNIA.—J. H. Davidson, M. D., President, Los Angeles; J. R. Laine, M. D., Secretary, Sacramento. The Secretary reports for July: Returns from 45 cities, towns, villages and sanitary districts, aggregating a population of 653,314, show a mortality of 911—a death-rate of 1.39 per thousand for the month, or 16.68 per thousand per annum. There were 131 deaths from consumption, 62 from pneumonia, 78 from bronchitis, 17 from congestion of the

lungs, 7 from diarrhoea and dysentery, 17 from cholera infantum, 110 from other diseases of the stomach and bowels, 4 from diphtheria, 4 from croup, 1 from scarlatina, 5 from whooping cough, 3 from typho-malarial fever, 14 from typhoid fever, 2 from remittent and intermittent fevers, 6 from cerebro-spinal fever, 42 from cancer, 1 from erysipelas, 88 from heart diseases, 3 from alcoholism, and 366 from all other causes.

San Francisco, 330,000; Reports for July: Deaths, 505—134 under five years of age. From consumption, 72; acute pulmonary diseases, 61; from zymotic diseases, 37. Annual death rate, 18.36. Chinatown is comparable to the tenement house rookeries of New York, and the health authorities have declared their intention to deal with them accordingly. The doctors have held a meeting with regard to it, and the health officer threatens to make such warfare on the filth of Chinatown as will strike terror to the hearts of the disease breeding heathens.

Los Angeles, 100,000; Reports for July: Deaths, 94—23 under five years of age. From consumption, 21; acute pulmonary diseases, 2; from zymotic diseases, 14. Annual death rate, 11.28.

COLORADO.—*Denver*, 150,000: William P. Munn, M. D., Health Commissioner, reports for June: Deaths, 146. From phthisis, 25—17 contracted elsewhere. Annual death rate, 11.68. Unclean bakeries have been the subject of recent complaints, and a number of them have been found to be abominably filthy. Health Commissioner Munn has declared war on them.

CONNECTICUT.—Professor William H. Brewer, Ph. D., New Haven, President; Professor C. A. Lindsley, M. D., Secretary, New Haven.—The Secretary's bulletin for July comprises reports from 164 towns in the State, with an aggregate population of 850,206, from which the number of deaths reported for the month was 1,611. The death rate for the larger towns is 24.3; for the smaller, 18.3, and for the whole State, 22.7. Deaths from zymotic diseases, 617—38.2 per cent. of the total mortality—chiefly from diarrhoeal diseases, 445, and diphtheria, 51.

DELAWARE.—E. W. Cooper, M. D., President, Camden; E. B. Frazer, Secretary, Wilmington.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M. D., State Health Officer, Jacksonville.

Invalids and valetudinarians who have heretofore been loath to avail themselves of the climate of Florida, in default of local sanitation, will be glad to learn that the City Councils of St. Augustine

and Jacksonville are at last taking action with a view to establishing boards of health, in default of which in Florida towns generally, with two or three exceptions, many persons of tender health are constrained to deny themselves the benefit of a climate contaminated by unsanitary local conditions.

ILLINOIS.—William E. Quine, M. D., President, Chicago; J. W. Scott, Secretary, Springfield.

Eighteenth Annual Report, 1895, together with official register of legally qualified physicians and midwives, and directory of medical societies.—It consists of the minutes of the several quarterly meetings during the year, beginning with brief summaries of the communicable diseases during the previous year. Of *small-pox* there were in Chicago, in 1894, 3,062 cases, with 1,029 deaths. In the State outside of Chicago, 25 cases with nine deaths were reported from five localities, and besides these, there appear to have been some other outbreaks, but the results are not given. Of the other communicable diseases reported upon at the January meeting (1895), the localities of their prevalence only are named. It is observed, however, that the number of localities reporting the existence of infectious diseases during this quarter is largely in excess of any previous quarter during the preceding two years. The committee on School Hygiene reported sundry bad conditions of the school houses throughout the State, and urged the necessity of teachers paying more attention to the advice of the medical profession with regard to the personal hygiene of the pupils, urging that—

"It should be a live principle with all teachers that the acquisition of dead knowledge should never be gained at the cost of vital forces. That the progress of a few talented pupils should not be accelerated to the disadvantage of the less favored great majority, and that accurate observation and a logical method of thinking are the main factors of the human mind, by means of which the children will be able to reconstruct whatever they have once thoroughly understood."

Action was taken with a view to having the report printed and sent to all teachers.

The second quarterly meeting was almost wholly devoted to the medical practice act and licensing boards. A vote of thanks was extended to Dr. A. R. Reynolds, Health Commissioner of Chicago, for his management of the small-pox epidemic of 1894 in that city.

At the June meeting: With the exception of scattered cases of small-pox the State was reported to be remarkably free from contagious and infectious diseases. At the third quarterly meeting, September 30, Dr. N. S. Davis, of Chicago, appeared before the Board in the interest of the Northwestern University School of Medicine, and addressed the Board. Outside of Chicago typhoid fever was reported in seven localities; diphtheria in eight, scarlet fever in three, and small-pox in three.

Chicago, 1,619,226: William R. Kerr, Commissioner, reports for July: Deaths, 2,457—1,357 under five years of age. Death rate for the month, 1.17; for the year ending July 31, 14.83. Prevailing causes of death and the numbers: From diphtheria, 54; typhoid fever, 58; consumption, 184; pneumonia, 95; bronchitis, 49; whooping cough, 28; diarrhoeal diseases, 539.

The large increase in typhoid fever cases is a just cause of concern to the whole population of the city; it shows the impurity of the drinking water. The Chicago *Tribune* of July 28 published an article setting forth the condition of the water, in part as follows:

"Sewage from the river has carried its contamination to every crib from which the city receives its water supply. The last examination made at 5 o'clock yesterday afternoon, showed the water to be in bad condition at all the intakes. 'Tell the people to boil the water; boil it hard, and boil it thirty minutes before they drink it,' said Assistant Health Commissioner Reilly. The analysis made at noon showed that the Lake View and Hyde Park supplies were already polluted, and that the condition of the water from the two-mile and four-mile cribs was close to the danger line. Lake View water has been bad for a long time. This is what the chemist [Prof. Kennicott] says: 'The contamination has reached the fourth-mile crib. All other cribs show undigested sewage.' Said Assistant Commissioner Reilly: 'The water supply of Chicago has been dangerously contaminated for almost seventeen weeks, but the conditions were worse yesterday than usual. The rapidity with which the sewage reached the four-mile crib yesterday was marvelous.'"

INDIANA.—Douglass C. Ramsey, M. D., President, Mount Vernon; J. N. Hurty, M. D., Secretary, Indianapolis.

Typhoid fever is reported epidemic at Princeton, Gibson County. The Health Officer at Circleville, Clinton County, also reports cases, and pools of stagnant water in the neighborhood. He asks aid of the State Board, but the Board is unfortunately without funds for even the traveling expenses of the Secretary. Hence the only aid available in either case was a letter of instructions.

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

Davenport, 31,484: A. W. Cantwell, M. D., Physician; Report for July: Number of deaths, 47—18 under five years of age. Death rate per 1,000, 17.9. Zymotic diseases caused 14 deaths, and consumption, 4.

KENTUCKY.—Joseph M. Matthews, M. D., President, Louisville; J. N. McCormack, M. D., Secretary, Bowling Green.

Small-pox is giving a good deal of trouble at Paducah. Aug. 8 (Louisville *Times*) three new cases developed, making the total number seven.

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. F. Patton, M. D., Secretary, New Orleans.

New Orleans, 295,000—80,000 colored: Deaths in July, 537—colored, 227—156 under five years of age—53 colored. Deaths from consumption, 68; pneumonia, 22; bronchitis, 9; *small-pox*, 2; cholera infantum, 19; enteritis, 12. Death rates: Whites, 19.07; colored, 34.05: 23.43.

MAINE.—C. D. Smith, M. D., President, Portland; A. G. Young, M. D., Secretary, Augusta.

At the quarterly meeting of the Board, July 27, Prof. Robinson reported upon the use of formic aldehyde as a disinfectant and the means of applying it. He said that the tests of formic aldehyde which had been made had given very encouraging results. He exhibited to the Board the workings of a lamp which he had constructed for its application. The lamp consists of a cylinder into which wood alcohol is continuously fed from a tank similar to that of a German student's lamp. In the top of the cylinder is fitted a diaphraghm of copper gauze consisting of two layers, between which is a layer of especial active material. Upon the application of gentle heat to the gauze the alcohol below begins to vaporize and change into formic aldehyde, a gas having the germicidal properties of sulphurous acid gas, such as is generated by burning sulphur, but in a greater degree. The vaporization progresses as long as alcohol is supplied.

Prof. Robinson detailed experiments which had been made at the Bowdoin laboratories upon pure cultures of disease germs and upon infected bedding and clothing, by which the germs were quickly killed. Subsequent cultures made from infected articles were found after exposure of the fabrics to the fumes from the lamp to have been absolutely sterilized.

Sanitarians have for some time been trying to find a method of utilizing formic aldehyde as a practical disinfectant on account of its cheapness, and this lamp seems to offer a ready solution of the problem. About a pint of the alcohol, vaporized, would supplant the atmosphere in a room of 3,000 cubic feet.

MARYLAND.—John Morris, M. D., President, Baltimore; James A. Steuart, M. D., Secretary, Baltimore.

Baltimore, 506,398—75,344 colored. James F. McShane, M. D., Health Commissioner, reports for June: Deaths, 1,229; 961 white persons, and 268 colored. Death rates: Whites, 26.75; colored, 42.88; 29.14; 663 were children under five years of age. Deaths from consumption, 104; pneumonia, 31; cholera infantum, 211; diptheria, 10; typhoid fever, 9; infectious cases, 144.

MASSACHUSETTS.—H. P. Walcott, M. D., Chairman. Cambridge; S. W. Abbott, M. D., Secretary, Boston.

Boston, 501,083; S. H. Durgin, M. D., Chairman. Deaths in June 821—279 under five years of age. Annual death rate, 19.66 per 1,000. From diptheria, 40; scarlatina, 18; consumption, 111. Cases of contagious diseases reported for the month: Diphtheria, 352; measles, 394; scarlatina, 113; typhoid fever, 40.

Cambridge.—Typhoid fever is reported (Boston Transcript, Aug. 11) epidemic. About fifty cases have been reported for July and up to August 11th. The cause has not yet been discovered. Milk is suspected *per se*, or by reason of unclean cans.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

The Secretary reports for July: Compared with the preceding month, cholera infantum, dysentery, cholera morbus and diarrhoea increased in area of prevalence.

For the month of July, 1896, compared with the average for July in the ten years 1886-1895, consumption, intermittent fever, remittent fever and cholera infantum were less than usually prevalent.

Including reports by regular observers and others, *consumption* was reported present in Michigan in the month of July, 1896, at 213 places; *typhoid fever* at 82 places; *measles* at 65 places; *scarlet fever* at 44 places; *whooping-cough* at 40 places and *diphtheria* at 27 places.

Reports from all sources show *consumption* reported at 5 places more; *typhoid fever* at 39 places more; *measles* at 13 places less; *scarlet fever* at 5 places less; *whooping-cough* at 4 places more and

diphtheria at 1 place less in the month of July, 1896, than in the preceding month.

MINNESOTA.—Franklin Staples, M. D., President, Winona; C. N. Hewitt, M. D., Secretary, Red Wing.

St. Paul, 140,292: Alexander J. Stone, M. D., Commissioner, reports for July: Deaths, 188—107 under five years of age. Annual death rate per 1,000 was 15.03. Deaths from diphtheria, 9; consumption, 22; cholera infantum, 28.

Minneapolis, 225,602: H. N. Avery, M. D., Commissioner, reports for July: Deaths, 221—110 under five years of age. Deaths from diphtheria, 3; cholera infantum, 44; consumption, 20; typhoid fever, 4. Death rate for the year ending July 31st, 8.80.

MISSOURI.—F. J. Lutz, M. D., President, St. Louis; Willis P. King, M. D., Secretary, St. Louis.

St. Louis, 570,000—31,000 colored: M. C. Starkloff, M. D., Commissioner of Health, reports for July: Deaths, 952—354 under five years of age. From diphtheria, 16; phthisis, 84; typhoid fever, 13; pneumonia, 32; bronchitis, 18; diarrhoeal diseases, 166. Annual death rate per 1,000, 20.0.

And St. Louis, too, is afflicted with a *Chinese quarter*, almost as bad as that of San Francisco. "Hop Alley" is reported (Chronicle, Aug. 4) to be the garbage receptacle of a dense Chinese population, who keep no other, and a prohibited passway.

"Them pipe fiends," said a resident, pointing to the street beyond, "never keep a garbage can. They throw everything out the windows, in the alley, over the fence in my back yard, on the roof, in the air—anywhere—and Confucius only knows where."

"Chinaman no likee eatee too much. Too walm now. Eatee too muchee, makee sick. Hot wellah satee littee bit. Flow lest away. No gette sick."

Kansas City, 150,000: E. Von Quast, M. D., Health Officer, reports for June: Deaths, 178—76 under five years of age. Annual death rate per 1,000, 14.24. Deaths from diphtheria, 3; consumption, 8; cholera infantum, 14.

NEBRASKA.—J. V. Beghtol, M. D., President, Friend; F. D. Haldeman, M. D., Secretary, Ord.

Omaha, 140,452: S. R. Towne, M. D., Commissioner of Health. Report for May, 1896: Deaths, 59—19 under five years of age. Annual reath rate, 5.0. Communicable diseases reported: Diphtheria, 2; scarlet fever, 10.

NEW HAMPSHIRE.—G. P. Conn, M. D., President, Concord; Irving A. Watson, M. D., Secretary, Concord.

Manchester, 44,126. Board of Health report for July: Deaths, 135; the death rate being 28.92. In July of last year there were 104 deaths, the rate being 20.73. The number of deaths last month from zymotic diseases was 60; deaths under five years, 93; consumption, 10; heart disease, 8; pneumonia, 4; bronchitis, 2; cholera infantum, 2.

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

Hudson County.—Jersey City and vicinity, 338,671: Report for July: Deaths, 613—344 under five years of age; from diphtheria 31; typhoid fever, 5; total from zymotic diseases, 158; from consumption, 60; pneumonia, 34; diarrhoeal diseases, 84. Annual death rate, 26.0.

Newark, 215,725: Health Officer Chandler reports for the two weeks ending July 11. Deaths, 188—103 under five years of age; from diphtheria, 7; consumption, 18; pneumonia, 10; diarrhoeal diseases, 55. Annual death rate, 22.62.

Paterson, 103,020: J. L. Leal, M. D., Health Officer, reports for July: Deaths, 250—159 under five years of age; from diphtheria, 17; consumption, 15; pneumonia, 2; diarrhoeal diseases, 96. Annual death rate, 24.26 per 1,000.

Polluted Water at Mount Holly.—For several weeks the water supply in this city has been unfit for use, and there is still no prospect of a remedy. The directors of the water company claim that the water is polluted before it is pumped in the reservoir, but it is now alleged by a prominent official connected with the company that the new reservoir recently constructed is faulty, and that unless changes are made to aerate the water as it goes into the basin it will always retain its present disagreeable odor and taste.

The water enters and recedes from the basin from the bottom, which allows the top portion to remain exposed to the hot sun, and as the walls of stone and cement will not allow of absorption, it is claimed the top surface becomes polluted, thus destroying the entire contents of the larger basin.

NEW YORK.—Daniel Lewis, M. D., President, New York; B. T. Smelzer, M. D., Secretary, Albany.

The Secretary's *Bulletin* for June reports 9,342 deaths, which is 200 less than that of the preceding month, but is 600 greater than that of June, 1895. The death rate for the month was 16.85, against

17.50 in May and 19.30 in April, that of June, 1895, having been 16.10. The customary decrease in the mortality is less than usual, the average daily mortality for the month being in fact greater than in May, 311 against 308, that for June for the past ten years having been 285. Of the 9,342 deaths, 37.0 per cent. occurred under the *age of five years*, and 18.3 per cent. were from *Zymotic diseases.* More than half of the deaths of this class, and nearly ten per cent. of the total mortality, were from *Diarrhoeal diseases.* The diarrhoeal mortality of June is very variable, some years the number being less than 500 and others over 1,000, because of the varying earliness of commencement of the summer increase. This month there were 900 deaths, or about 250 more than the average. In the Maritime district 12.5 per cent. of the total mortality was from this cause, and in the Lake Ontario and Western districts 9.0 per cent., but in the more rural parts of the State it constituted but from 2.0 to 4.0 per cent. of the total mortality. From all other Zymotic diseases respectively there were fewer deaths than in May. From *Consumption* there were 1,100 deaths, which is above the average for the month. *Acute Respiratory* diseases decreased one half from May, a saving of six hundred in the number of deaths, less than 10 per cent. of the total mortality being from this cause against 15.5 per cent. in May. There is an increase in the reported mortality from diseases of the *Digestive system*, which always varies with the diarrhoeal mortality. Deaths from all other local diseases are less than in May. Next to November, June is the healthiest month of the year in this State. The average mean barometer was 29.96, the relative humidity 71 per cent. and the average temperature for the entire State 69° or 2° above the normal; there was an average rainfall of 3 inches, a slight deficiency. The prevailing wind was south-west.

New York City, 1,995,000: Reports for the month of June: Deaths, 3,281—1,543 under five years. Death rate, 20.00. Zymotic diseases per 1,000 from all causes, 224.35; diphtheria, 165; typhoid fever, 13; consumption, 409; acute respiratory diseases, 351; diarrhoeal diseases, 389.

The Recent Hot Term (including therein all days when the temperature reached 90° or upwards), specially reported by Dr. ROGER S. TRACEY, Register or Records, began Aug. 4 and ended Aug. 13. The maximum temperatures for the ten days were successively as follows: 90°, 94°, 92°, 97°, 95°, 98°, 94°, 96°, 93°, 90° (Central Park Observatory.)

The heat, so far as shown by the registered mortality, did not produce much effect until several days had elapsed, the reported deaths being as follows: Aug. 4th, 139; 5th, 108; 6th, 109; 7th, 131; 8th, 132; 9th, 146; 10th, 129; 11th, 240; 12th, 335; 13th, 374; making a total for 10 days of 1,843; the reported deaths during the remainder of the second week were as follows: Aug. 14th, 321; 15th, 265.

The total reported deaths during the week ending Aug. 8th, including the first five days of the heated term were 809, and during the week ending Aug. 15th, including the second five days, the reported deaths were 1,810, the highest number ever recorded in this city, making the death rate 48.65 per 1,000 upon an estimated population of 1,941,039.

Of the deaths in the second week 648 were due to the heat alone, no other cause being assigned, and in the first week, 11, making a total of 659 deaths due to the high temperature. Of the 1,810 deaths, 1,776 were white, and 34 colored. 70 were under 1 month of age; 321 between 1 month and 1 year; 161 between 1 and 5 years; 102 between 5 and 25; 502 from 25-45, 423 from 45 to 65 and 226 were 65 or over; 436 died in institutions, 1,134 in tenements, 156 in private dwellings, 29 in hotels and boarding houses and 55 in other places. The principal causes of death, other than heat stroke, were as follows: Diphtheria, 32; scarlet fever, 2; measles 9; whooping-cough, 8; typhoid fever, 15; diarrhoeal diseases, 194; ditto of children under five, 168; phthisis, 114; heart diseases, 61; pneumonia, 61; bronchitis, 22; Bright's disease, 77; puerperal diseases, 12; violence, 72.

Brooklyn, 1,100,000: For June, deaths, 1,865—891 under five years. Death rate, 20.50. From zymotic diseases per 1,000 from all causes, 245.00; diphtheria, 113; typhoid fever, 2; consumption, 203; acute respiratory diseases, 172; diarrhoeal diseases, 276.

Observations and results of the recent hot term, specially reported by Dr. GEO. E. WEST, Secretary of the Board, as follows:

During the week ended at noon on Saturday, August 15, there were reported to the Department of Health 876 deaths, a number far in excess of that for any other week in the history of the city. The death rate per thousand, however, assuming that the estimated population of 1,125,000 is approximately correct, was 40.7, which rate has been exceeded at least four times since accurate death records began to be kept. For the week ended July 3, 1880, the rate was 43.2; July 29, 1882, 52.1; July 11, 1885, 45.9; and April

18, 1891, 42.2. With the single exception of the last, which was due to epidemic influenza, all of these high death rates have occurred simultaneously with high temperatures and have been characterized by a large percentage of infant mortality from summer diarrhoeas. During the first three weeks mentioned above, the percentages of deaths of children under five years of age to the total deaths for the corresponding weeks were respectively, 71.9, 66.7 and 70.9.

In marked contrast to these figures are those for the week of August 15, 1896, during which the percentage of deaths under five was but 34.4 of the total. The excessive mortality of the week was largely confined to adults who were stricken down either by the direct rays of the sun or by the intense heat engendered thereby. Sunstroke and heat prostration were certified as the causes of 215 deaths, a number that has never before in the history of the city been even approximated. The previous record occurred in the summer of 1892 when, during the week ended August 16, fifty-six deaths were recorded as due to the immediate effect of solar heat. How many deaths of persons suffering from chronic disease of the heart and other organs were accelerated by the heat, it is impossible to state, but doubtless the number was not small. Taking everything into consideration, I think it safe to say that the week of August 15, 1896, was one of the most destructive that this city has ever experienced.

Buffalo, 335,709: Reports for June: Deaths, 330—127 under five years. Death rate, 12.0. From zymotic diseases per 1,000 deaths, from all causes, 348.50; diphtheria, 13; acute respiratory diseases, 44; consumption, 33; diarrhoeal diseases, 52.

Rochester, 160,000: For June, deaths, 219—54 under five years. Death rate, 16.37. From zymotic diseases, per 1,000 deaths, from all causes, 109.00; consumption, 29; acute respiratory diseases, 24.

Albany, 100,000: Deaths, 173—50 under five years. Death rate, 20.75. From zymotic diseases, per 1,000 deaths, from all causes, 150.25; typhoid fever, 3.

Syracuse, 100,000: For May, deaths, 118—26 under five years. Death rate, 15.0. From zymotic diseases per 1,000 deaths from all causes, 170.00; consumption, 10; acute lung diseases, 2.

Elmira, August 12th: At the meeting of the Board of Health yesterday, the following resolutions were adopted:

Resolved, That the water taken from the Chemung river and reservoirs, and furnished by the Elmira water works company to

the inhabitants of the city of Elmira for domestic use and drinking purposes, is contaminated with sewage, impure and unwholesome; and said water is hereby condemned and its use for such purposes declared to be detrimental to public health, and the furnishing of said water to be a public nuisance.

Resolved, That the said Elmira water works company is hereby ordered and directed to commence the construction of a proper filterating plant or apparatus for the purification of said water on or before the 14th day of September, 1896; and if the said company fails to comply with this order, a penalty of $100 is hereby imposed upon it for such failure.

Resolved, That the Secretary of this board serve or cause to be served a copy of this order upon the said Elmira Water Works Company.

Four actions are now pending in the courts against the Elmira Water Works company to recover the penalties imposed on the company for failing to comply with the orders of the Board imposed in the former resolutions adopted by that body condemning the water supply.

The attorney of the Board of Health was instructed to enforce the health laws of the city against the Water company and to institute the legal actions as soon as possible. The company has, so far as can be ascertained, taken no definite action toward bettering the water supply.

NORTH CAROLINA.—George G. Thomas, M. D., President, Salem; Richard H. Lewis, M. D., Secretary, Raleigh.

July bulletin summarizes the report of 79 counties for June. The mortuary statistics for the month, of an aggregate population of 26 towns, 80,972 white and 59,163 colored: Deaths, respectively, 131 and 133, and death rates 19.2 and 27.0. The chief causes of death were: Consumption, 37; pneumonia, 8; measles, 6; brain diseases, 27; heart disease, 12; diarrhoeal diseases, 48; typhoid fever, 15. Deaths under five years of age, 95—45 colored.

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus.

Annual Report for the year ending Oct. 31, 1895, shows general good health throughout the State for the year until autumn when typhoid fever became more than usually prevalent. The Secretary continues to deplore the need of a proper system for the collection of vital statistics, which would secure full and accurate data. No one knows the number of deaths or the number of births that occurred in the State during the past year, or any other year; thousand die and thousands are born, of whom no official record is made

or can be obtained. Crime is made easy, the settlement of estates and legacies difficult, and a study of the causes of death and means for their removal impossible, from the lack of such records.

Small-pox appeared at sixteen localities during the year, aggregating 206 cases, of which 131 were in Cincinnati.

Water Supplies and Sewerage are becoming each year more difficult and more costly, because of increasing population and the neglect of timely measures for the prevention of water pollution. Many of the smaller streams of the State are already grossly polluted with sewage, and the difficulty of supplying communities with pure drinking water proportionally magnified.

Local Boards of Health are now organized in 620 municipalities, 1,118 townships. While in many places the duties of the boards are neglected, as a rule much excellent work has been done, and the ravages of preventable diseases greatly lessened. Their special reports on Contagious Diseases, Public Water Supplies, Sewerage Systems, Sewage Disposal Works, Nuisances, and Inspection of Public Institutions, are comprehensive and eminently practical. Besides there are several other reports of investigations made of various nuisances, pollution of water supplies, and public institutions; and the reports of the proceedings of the Sanitary Convention at Cleveland, and of the Ohio Boards of Health, which altogether render it a volume of exceptional value and of much practical utility.

Cincinnati, 350,000: J. W. Prendergast, M. D., Health Officer, reports for July: Deaths, 515—193 under five years of age. Death rate, 17.64 per 1,000. From diphtheria, 14; typhoid fever, 6; consumption, 53; pneumonia, 22; diarrhoeal dieases, 46.

Cleveland, 330,279: J. L. Hess, M. D., Health Officer, reports for July: Deaths, 617—369 under five years; from diphtheria, 2; typhoid fever, 13; consumption, 29; pneumonia, 41; diarrhoeal diseases, 138. Death rate, 14.69.

Toledo, 137,780: J. T. Woods, M. D., Health Officer, reports for July: Deaths, 125—54 under five years of age. Annual death rate, 10.8 per 1,000. From diphtheria, 2; typhoid fever, 5; consumption, 5; diarrhoeal diseases, 32.

Coalton, a village of about 500 inhabitants, is reported (State Journal, Aug. 1st) to have an epidemic of diphtheria, fifteen deaths from it having occurred during the last week in July.

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

Philadelphia, 1,188,793: Theodore B. Stulb, Health Officer, reports for four weeks ending July 25: 2,156—1,136 under five years of age. Deaths from diphtheria, 49; typhoid fever, 26; consumption, 179; pneumonia, 76; diarrhoeal diseases, 449.

Pittsburg, 280,000; Report for the year 1895: Deaths, 5,004—2,225 under five years of age. Annual death rate, 21.83. Deaths from acute infectious diseases, 600; typhoid fever, 213; diphtheria, 132; scarlet fever, 114; measles, 42; whooping cough, 28; septicaemia and puerperal fever, 26; cerebro-spinal fever, 25; erysipelas, 14; malarial fever, 6. From consumption, 366—7.31 per cent. of the total mortality.

The number of births recorded during the year was 6,753; marriages, 1,934.

The detail of the work of the Board shows excellent executive direction.

Report for four weeks ending July 25th: Deaths, 468—275 under five years of age; typhoid fever, 6; consumption, 25. Death rate, 21.7.

July 22 (Pittsburg Leader): Twelve new cases of *typhoid fever* were reported to the bureau of health this morning. The cause of the outbreak is as yet undetermined. An investigation is under way.

Sharpsburg borough, August 7 (Chronicle-Telegraph), is threatened with an epidemic of typhoid and scarlet fever and other equally dangerous diseases. The greatest number of cases of sickness are of typhoid fever, from which there have been three deaths within the present week. There is a fight on in the Board of Health which is likely to cause a delay in necessary work for the benefit of the health of the town. The Board was to have held a special meeting last night, but no quorum was present. The borough water is very bad on account of the recent heavy rains, and to this is attributed much of the present sickness. There was some talk of building a water reservoir, but recently it has found few supporters, and the people are compelled to drink the water as it comes from the Allegheny River, and that at its best is not very good.

Plymouth, August 1 (Wilkesbarre News-Dealer): There were but 12 new cases of typhoid fever during the month of July, as against 26 during the previous month. The source is contaminated water from the dams on the mountain above the town. The water has not yet been analyzed, although a move was made by the

Board of Health in that direction. Since the Council and Board of Health adopted aggressive measures, the Water Company has furnished the town with Spring Brook water. However, at night the water from the mountain dams is turned on and the force drives the Spring Brook water out of the pipes.

Allentown (Pittsburg Post), Aug. 3d, is suffering the results of an overflowing sewer—many cases of *typhoid fever*. During heavy rains the borough mains were inadequate to carry off the water, and the residents of the vicinity were often annoyed by the bursting of the pipes.

Dr. Criss, who is attending a number of fever patients, says:

"The condition of the sewer is certainly the cause of many of the cases of typhoid fever in the two boroughs, Bettzhoover and West Liberty. In West Liberty I have at least a half dozen patients, but the borough having no system of keeping account of infectious diseases, I cannot tell how many may exist."

SOUTH CAROLINA.—J. R. Bratton, M. D., Chairman, Yorkville; H. D. Fraser, M. D., Secretary, Charleston.

August 6th (Charleston News): The State Board of Health met at Greenville to-day at 11 o'clock at the Hotel Altamont, with the following full Board present: Dr. James Evans, of Florence, President, and Drs. T. Grange Simons, of Charleston; A. A. Moore, of Camden; C. R. Faber, Fort Motte; W. H. Nardin, Anderson; Charles M. Reese, Charleston; J. R. Beaton, Yorkville; Attorney General William A. Barber and Comptroller General James Norton. A number of special committee reports were received, the most important being the report from a committee appointed to investigate the sanitary condition of the county jails. Their reports, however, were not satisfactory, only ten jails being heard from. Some of these are reported to be in very bad condition. The board endorsed the action of the State Medical Association in appointing a committee to memorialize to have the bill providing for the collection of vital statistics of every township in the State passed at the next Legislative session. The health board is anxious to have the death and sickness record published to the world, as they believe that this report will show the death and sickness rate to be far smaller than is shown by the last census report. The prime object of these statistics will be to show to the world that we are in a much better sanitary condition than we are given credit for by the census.

Charleston, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M. D., Health Officer, reports for four weeks ending July 25th: Deaths, 177—129 colored. Under five years of age, 73. Annual death rates, white, 21.68: colored, 45.64; 35.55.

TENNESSEE.—J. D. Plunkett, M. D., President, Nashville; J. Berrien Lindsley, M. D., Secretary, Nashville.

The Secretary's Bulletin reports: The principal diseases, named in the order of their greater prevalence, in the State, for the month of June were: Malarial fever, dysentery, typhoid fever, measles, diarrhoea, consumption, cholera infantum, whooping cough, lung diseases acute, cholera morbus, scarlet fever, mumps, rheumatism, diphtheria, small-pox and meningitis.

Sanitary Exhibit: At the meeting of the State Board of Health, July 14, Dr. J. Berrien Lindsley, the Secretary, was directed to take such steps as were necessary to have the Department of Health of the State properly represented at the Centennial Exposition. Dr. Safford, of the Committee on Topography, reported that he was engaged in making a model of the State on a large scale for the Centennial Exposition.

Memphis, 55,923—white, 28,064; colored, 27,859. J. J. McGowan, M. D., Secretary of the Board of Health, reports for the month of July: Deaths, 142—74 colored. Death rates, white, 29.07; colored, 32.23; 30.47. Contagious diseases reported during the month: Diphtheria, 1; scarlatina, 10.

San Antonio, Tex., is reported (Express, July 24), to be in danger of an epidemic on account of the foulness of the San Antonio River. "On the surface there floats a brown putrid substance made up of oily refuse and other contaminations light enough to float and thoroughly mix into the oily scum. And over it all there hangs a sickening fetid odor arising from the polluted water, the decaying vegetable refuse and the putrifying carcasses of dogs, cats, fowl and fish."

UTAH.—*Salt Lake City*, 48,076: W. T. Dalby, M. D., Health Commissioner, reports for July: Deaths, 48; death rate, 8.22.

West Jordan (Salt Lake City News, July 27) has an epidemic of *diphtheria*, attributed to a big pool of stagnant water in a private roadway.

VERMONT.—C. S. Caverly, M. D., President, Rutland; J. H. Hamilton, M. D., Secretary, Ritchford.

The State Board of Health has issued (Burlington Free Press), Aug. 2) an urgent circular with reference to tuberculosis, in part as follows:

"Consumption, phthisis, tuberculosis, have each the same meaning. The disease is caused by a species of bacterium, called a bacillus. This bacillus is in the discharges of the patient that has consumption; the discharges from the nose, the throat, the bronchial tubes and lungs, in the urine and stools. It may be in the flesh of animals suffering from the disease and in the milk of tuberculous cows. To produce the disease the bacilli must enter the air passages or alimentary canal of a suitable subject. In other words, the causes of consumption are two-fold; predisposing and exciting;" and urging local boards of health to constant effort in the use of preventive measures against its spread.

"To this end the State Board of Health would suggest that consumption should be included in the list of 'infectious or contagious' diseases, which section 4684 R. L. requires should be reported to the health officer. Every health officer will, therefore, notify each physician practicing within his jurisdiction to report these cases, and will so far as possible, through local newspapers and otherwise, so advise all heads of families."

WASHINGTON.—*Seattle's* City Council has recently suffered (Press-Times, July 27) a spasmodic fit of constipation on account of an overfeed of canned beans and lobsters to a leper. It appears that a leper, according to the diagnosis of the health officer, has been in the pest house for some time, and the nurse under the necessity of supplying him with food. That, besides his quarters in the pesthouse, there should be presented a bill for supplying him with food, has so shocked the economics of the City Council that they have determined to have no lepers. They dispute the health officer's diagnosis, don't believe they have any leper, and run the risk of leprosy in their own persons rather than submit to such extravagance as a monthly expenditure of $34.00 for the food and nursing of a single leper. Sooner than submit to such extravagance—with an offer before them by another nurse to care for the leper and the pesthouse for $90.00 a month—they resolved to have no leper and voted to turn him adrift to shift for himself or to die in his bunk. It is apparent that the City Council of Seattle have yet to learn that he who promotes death causes it.

Spokane (Chronicle, Aug. 3d) has an epidemic of diphtheria.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; U. O. B. Wingate, M. D., Secretary, Milwaukee.

Milwaukee, 255,000: Walter Kempster, M. D., Commissioner of Health.

Inspection of Bakeries.—The committees on health and judiciary have reported (Eve. Wisconsin-Milwaukee), Aug. 3d, an ordinance to provide for the inspection of bakeries and candy manufactories and to prevent the manufacture and sale of unclean and unwholesome food. The ordinance has been changed since it was originally introduced in the common council at the instance of Health Commissioner Kempster. It now provides that any person who shall bake or cook any bread or food made from cereals, or manufacture any candy in the city of Milwaukee for the purpose of sale, shall keep the premises in which the same shall be baked or manufactured, and all utensils used in such business, in a clean and wholesome condition, under a penalty of not less than $5 and not more than $50 for each offence, and each day's violation of this law shall be deemed a separate offence.

CHOLERA.—*Public Health Reports* (M. H. S.), Aug. 21st.: To date of July 20, 13,343 cases of cholera, with 11,099 deaths, have been reported throughout Egypt, and during the period from July 14 to July 20, 1896, there were 1,540 deaths from cholera in Egypt, exclusive of the cities of Alexandria and Cairo.

YELLOW FEVER AND SMALL-POX in Cuba: Under date of August 10, the United States consul at Cardenas reports that during the week ended August 8 there were 15 cases of yellow fever and 4 deaths therefrom in that city.

The United States consul at Cienfuegos reports 8 deaths from yellow fever and 42 from small-pox in Cienfuegos during the week ended August 9.

The United States sanitary inspector at Habana reports that there were 52 deaths in that city from yellow fever during the week ended August 13.

The United States consul at Matanzas reports that during the week ended August 12 there were in Matanzas 28 deaths from yellow fever. He states that yellow fever is confined to the Spanish troops. No cases in the harbor.

The United States consul at Sagua la Grande reports that there were 191 cases of yellow fever, with 18 deaths therefrom, in Sagua la Grande during the two weeks ended August 8, 1896.

MORTALITY STATISTICS ABROAD FOR THE SECOND QUARTER, 1896.

Population, total mortality, annual death rate per 1,000, and deaths from measles, scarlatina, diphtheria and consumption.

London, 4,435,925; 19,699; 17.8; 1,530; 497; 602; 1860. Glasgow, 705,052; 3,595; 20.4; 179; 27; 28; ? Liverpool, 632; 3,329;

21.1; 91; 32; 34;? Manchester,529,561; 3,111: 23.5; 235; 53; 23; 21.1; 91; 32; 34; ? Manchester, 529,561; 3,111; 23.5; 235; 53; 23; ? Birmingham, 501,241; 2,487; 49.8; 56; 46; 74; ? Leeds, 402,-9; 292. Sheffield, 347,278; 1,618; 18.6; 79; 15; 19; ? Belfast, 277,-354; 1,787; 25.8; 87; 56; 13; 297. Edinburgh, 276,514; 1,148; 16.6; 7; 16; 19; 107. Bristol, 230,623, 959; 16.6; 67; 18; 7; ? Nottingham, 229,775; 955; 16.6; 40; 9; 3; ? Bradford, 228,809; 923; 16.1; 3; 2; 3; ? Hull, 220,844; 952; 17.2; 75; 16; 12; ? Newcastle, 212,223; 952; 17.9; 34; 10; 7; ? Salford, 210,707; 1,241; 23.6; 50; 32; 6; ? Leicester, 198,659; 831; 14.7; 25; 7; 15; ? Portsmouth, 178,639; 696; 15.6; 49; 4; 1; ? Cardiff, 162,699; 624; 15.3; 8; 4; 11; ? Brighton, 120,499; 413; 13.7; 4; 0; 2; ? Norwich, 108,630; 406: 14.9; 22; 1; 4; ? Plymouth, 90,276; 402; 17.8; 13; 2; 2; ? Amsterdam, 487,772; 2,546; 20.9; 103; 13; 38; ? Rotterdam, 272,042; 1,254; 18.4; 11; 3; 11; ? La Haye, 180,455; 701; 15.5; 11; 3; 7; ? Luxembourg, 19,945; 93; 18.7; 0; 0; 1; 11. Paris, 2,424,705; 12,305; 20.3; 200; 57; 138; 2,517. Lyon, 438,077; 2,202; 20.1; 30; 11; 14; 402. Lille, 216,276; 1,202; 22.2; 30; 1; 7; 212. Saint-Etienne, 133,443; 739; 22.2; 88; 4; 6; 84. Nantes, 125,029; 625; 20.0; 48; 0; 5; 123. Le Havre, 119,470; 891; 29.8; 47; 0; 8; 136. Reims, 105,408; 571; 21.7; 14; 0; 12; 88. Nice, 97,720; 506; 20.7; 1; 0; 1; 69. Nancy, 90,748; 501; 22.1; 0; 0; 4; 79. Limoges, 76,439; 400; 20.9; 1; 4; 6; 77. Besancon, 58,010; 298; 20.5; 1; 1; 1; 46. Pau, 33,111; 148; 17.9; 5; 0; —; 47. Berlin, 1,688,849; 7,315; 17.3; 56; 90; 121; 1,050. Hambourg, 625,-552; 3,046; 19.5; 76; 14; 18; 403. Munich, 406,000; 2,415; 23.8; 14; 11; 45; 369. Leipzig, 403,461; 2,013; 19.5; 34; 19; 54; 251. Breslau, 367,769; 2,580; 28.1; 62; 45; 37; 415. Cologne, 324,000; 1,949; 24.1; 237; 10; 32; 228. Dresden, 334,066; 1,619; 19.4; 15; 12; 23; 248. Frankfort, S. M., 235,052; 935; 15.9; 8; 7; 11; 175. Magdebourg, 215,872; 1,032; 19.1; 6; 3; 41; 117. Dusseldorf, 179,685; 806; 17.9; 1; 7; 11; 104. Koenigsberg, 173,642; 1,214; 28.0; 75; 12; 14; 95. Nuremberg, 164,689; 877; 21.3; 0; 5; 9; 182. Chemnitz, 163,562; 1,011; 24.7; 0; 3; 14; 100. Stuttgart, 161,485; 648; 16.1; 6; 2; 6; 64. Altona, 149,608; 701; 18.7; 45; 4; 8; 74. Breme, 143,834; 586; 16.3; 15; 2; 13; 102. Stettin, 143,592; 946; 26.4; 20; 15; 18; 73. Elberfeld, 140,716; 538; 15.3; 5; 0; 7; 87. Charlottenbourg, 138,931; 569; 16.4; 1; 1; 2; 57. Barmen, 128,-269; 523; 16.3; 1.4; 0; 10; 87. Dantzig, 126,141; 648; 20.5; 0; 0; 4; 72. Halle, 118,040; 619; 21.0; 0; 8; 15; 70. Brunswick, 116,-277; 544; 18.7; 0; 4; 4; 82. Aix-la-Chapelle, 111,279; 559; 20.1;

4; 2; 5; 68. Crefeld, 107,486; 482; 17.9; 28; 6; 12; 71. Essen, 98,-218; 445; 18.1; 3; 0; 8; 65. Mannheim, 92,523; 440; 19.0; 1; 1; 11; 55. Mayence, 77,528; 382; 19.7; 1; 3; 1; 65. Metz, 65,791; 241; 14.7; 3; 0; 3; 41. Berne, 48,328; 226; 18.7; 0; 0; 9; 34. Bale, 78,860; 396; 20.1; 20; 0; 13; 50. Geneve, 80,111; 427; 20.8; 8; 6; 6; 72. Lausanne, 36,619; 183; 20.0; 6; 0; 1; 27. Zurich, 126,497; 590; 18.7; 4; 2; 0; 85. Chaux-de-Fonds, 31,173; 139; 17.8; 0; 1; 1; 21. Vienne, 1,526,623; 10,213; 26.8; 447; 156; 159; 1,904. Bude-Pesth, 579,275; 4,384; 30.3; 63; 51; 79; 739. Prague et faub, 364,-632; 2,214; 24.3; 110; 11; 28; 400. Trieste, 161,886; 1,128; 28.9; 33; 29; 42; 163. Lemberg, 135,908; 883; 26.0; 6; 11; 13; 239. Gratz, 119,413; 874; 29.3; 7; 8; 21; 214. Brunn, 100,210; 756; 30.2; 5; 25; 19; 176. Cracovie, 80,310; 762; 38.0; 75; 11; 17; 131. Pilsen, 55,685; 301; 21.6; 0; 1; 4; 53. Linz, 50,689; 375; 29.6; 0; 3; 2; 89. Copenhagen, 333,714; 1,406; 21.1; 1; 6; 16; 237. Stockholm, 267,100; 1,291; 19.3; 19; 6; 5; 186. Gothembourg, 114,512; 440; 15.4; 0; 10; 7; 65. Christiania, 174,717; 932; 21.3; 27; 0; 3; 140. St. Petersbourg, 954,400; 8,334; 34.9; 283; 277; 213; 978. Varsovie, 553,643; 2,924; 21.1; 74; 57; 27; 364. Odessa, 353,000; 1,862; 21.1; 21; 24; 25; 289. Bucharest, 232,009; 1,651; 28.5; 10; 10; 9; 330. Bruxelles, 190,313; 950; 19.9; 31; 1; 4; 147. Anvers, 262,255; 972; 14.8; 17; 2; 12; 128. Liege, 163,207; 652; 15.0; 40; 22; 1; 73. Gand, 157,214; 717; 18.2; 3; 4; 3; 51. Malines, 53,772; 240; 17.8; 0; 0; 2; 3.

During the first quarter 1896. Population, total mortality, annual death rate per 1,000 and deaths from *cholera*.

Cairo, 353,488; 4,121; 46.7; 1. Alexandria, 481,703; 4,936; 42.6; 60. Bombay, 824,764; 6,957; 33.9; 24. Deaths from cholera during the week, May 21-27, in Cairo, 261; Alexandria, 107; Bombay, 42; Calcutta, 185.

PEOPLES.—Of every 1,000 Europeans 262 are subjects of Russia, 139 of Germany, 116 are Austro-Hungarians, 107 French, 106 English, 84 Italians, 48 Spaniards, 17 Belgians and 121 of the minor countries.

Of every 1,000 Asiatics 424 are Chinese, 337 are Hindus (subjects of England), 48 are Japanese, 48 are Indian islanders, including 23 in the French Possessions, 13 are Koreans, 11 are Siamese, nine are Burmans, nine are Persians, nine are Russians, five are Siberians, five are Afghans, four are Singhalese, three are Arabs and 52 belong to smaller nationalities.

FOR THE INCREASE OF POPULATION IN FRANCE, a new society has been formed which proposes, as one of the means to accomplish its object, to check the mortality among infants, especially such as is due to criminal neglect or worse. As matters stand, 50 per cent. of the population of most countries die before youth is reached. The reduction of mortality among the young, if it can be accomplished, would speedily show a favorable result. But the society has taken a big contract.

RIVALS THE JURKES.—Professor Pellmann, of Bonn University, Germany, has made a special study of hereditary drunkeness (*Med. News*). He has taken certain individual cases, a generation or two back, and traced the careers of children, grandchildren and great-grandchildren in all parts of the present German Empire until he has been able to present tabulated biographies of the hundreds descended from some original drunkard. The last person whom Professor Pellmann has immortalized thus in medical literature is Frau Ada Jurke. She was born in 1740, and she was a drunkard, a thief and a tramp for the last forty years of her life, which ended in 1800. Her descendants have numbered 834, of whom 709 have been traced in local records from youth to death by Professor Pellmann. Of the 709 he found 106 were born out of wedlock. There were 142 beggars, and 64 more who lived from charity. Of the women, 181 led disreputable lives. There were in this family 76 convicts, seven of whom were sentenced for murder. In seventy-five years this whole family rolled up a big bill of costs in almshouses, trial courts, prisons and correctional institutions. Professor Pellmann says this bill which the authorities of Germany, and therefore the taxpayers have paid, has been at least 5,000,000 marks, or about $1,250,000.

DISINFECTING FACILITIES IN QUARANTINE.

A Floating Disinfecting Plant has been recently added to the New York Quarantine establishment, by the use of which the disinfection of vessels, merchandise and baggage, and personal cleansing of passengers, may be much more promptly effected than heretofore. It consists of a capacious steamboat, with a steam-chest in the central part connected with disinfecting chests. On the upper deck, at the receiving end, is a hatch through which the

bedding and other articles are lowered. The clothing is then placed in the receiving end of the steam-chest, the door closed, and the process of disinfecting begins; when finished, the clothing, bedding, and so forth, are removed from the opposite end of the steam-chest into another room. It is in this room that the disinfecting apparatus is manipulated. Here the officer in charge can control the temperature of the water for the baths and of the steam-chest.

The sterilizing oven or steam-chest has three indicators—one that shows when a vacuum has been created by an air-pump to facilitate the action of the steam; the second, to indicate the steam pressure between the steel walls of the chest; and the third, to indicate the steam pressure within the chest proper.

In addition to the steam appliances there is provision for the use of sulphur dioxide; four pans, each large enough to hold a couple of pails of sulphur with a pipe leading from it carried up over the deck and down below again, and from thence to its final distribution.

The big distributing-pipe has four nozzles, and to them are attached the separate hose to carry the gas to different parts of the infected ship. This system is so regulated that when enough sulphur has been used the supply can be readily turned off. There are cocks all over the vessel—forward and aft, above and below. And water for washing or fluid for disinfecting can be carried anywhere in flexible pipes.

Near the after-part of the vessel is a small anteroom. On either side is a disrobing-room, where the clothing is made into a bundle, checked, and then tossed through an opening into a huge iron basket. The passenger and his garments are disinfected simultaneously, the clothes being subjected to heat, while the man steps into the bathroom. The baths can be supplied with salt or fresh water, either hot or cold. The bath over, he goes to the dressing-room and receives his bundle, which has been disinfected. Dressed, he can now go forward, where a ladder leads to the forward part of the upper deck, and so back to his ship.

The quarters of the crew, which are forward, are particularly convenient, and are fitted with separate bath and toilet, and arranged to be whitewashed frequently. The officers' quarters, which are also forward, are limited, but fitted with separate shower-baths and other conveniences. The boat has many large tanks to

carry a plentiful supply of fresh water, and if necessary could remain out on a prolonged cruise. The disinfecting-chest requires special mention. The anteroom where the clothing and bedding are received has moveable rails to support the cradle in which the material to be disinfected is placed. The huge door is so hung that no matter how rough the water and how much motion the boat may have, one man can swing it into place and secure the fastenings. The chest occupies the centre of the after-part of the ship, and all the other rooms are built around it and divided by bulkheads. The wall of the chest is composed of an outer and inner jacket, and powerful pumps exhaust the air to make the vacuum either between the jackets or in the chest.

To Health Officer A. H. Doty credit is specially due for adding this floating steam plant, which was contemplated in the organic quarantine law of 1863.

OBITUARY.

JOSEPH MEREDITH TONER, M. D., of Washington, D. C., died at Crepon, Pa., August 1, 1896. Dr. Toner was of Irish parentage, born in Pittsburg, Pa., April 30, 1825. His academic education was received at the Western University and at Mount St. Mary's College. His medical studies were pursued at the Vermont Academy of Medicine, in 1850, and at the Jefferson Medical College, in 1853, from which he received his degree of M. D. He practised successfully at Summit, N. J.; Pittsburg, Pa.; Harper's Ferry, Va., and finally at Washington, D. C., where he established himself in November, 1855. He has been one of the distinguished men of the medical profession for a period of thirty years. In 1873 he was President of the American Medical Association; in 1874, President of the American Public Health Association. He was a diligent student, a liberal contributor to contemporary literature, medical and other. Through the SANITARIAN, in 1873, he was among the first to advocate free parks and camping grounds for the sick and disabled children of the poor of crowded cities during the summer months. Dr. Toner was a book collector and also a great collector of Revolutionary relics, of which he had a small museum that in some respects rivalled that of the National Government.

Of his treasures he was exceedingly fond, and took great delight in showing them to visitors. His medical library he donated to the medical profession of Pittsburg, several years ago.

Dr. Toner was a true gentleman of the old school. Always polite and courteous to every one, and warmly attached to those whom he considered his friends. He had excellent conversational gifts, and a vast store of historic information, which was spiced with anecdotes and reminiscences for the delectation of those with whom he was personally associated. He never married.

JEROME COCHRAN, M. D., Dean of the Medical profession in Alabama, died at his home in Montgomery, August 18, 1896. He was born in Moscow, Tenn., December 4, 1831. He received a common school education at Oldfield schools and at an academy at Holly Springs, Miss., and took a private course, embracing biology, theology, metaphysics, logic, mathematics, French, Spanish and Italian. He studied medicine first at the Botanic Medical College of Memphis, being graduated there in 1856. He began practice the following year in Fayette County, Miss., but went soon after to Nashville and took the regular course of lectures at the medical department of the University of Nashville, where he received the degree of M. D. in 1861. He then entered the Confederate army as surgeon, serving there for three years. After the war he settled in Mobile. He was connected with the Medical College of Alabama for ten years, occupying first the chair of chemistry and later that of public hygiene and medical jurisprudence. Dr. Cochran was always identified with questions of public medicine and hygiene. He was the author of the medical and health laws of Alabama, was the Health Officer of the State, chairman of the State Board of Medical Examiners, and of the committee of public health of Alabama. He was a recognized authority on yellow fever, having been a member of the yellow fever commission in 1878, and being also the author of many articles on that disease in American and foreign journals and systems of medicine. He was a member of the American Public Health Association and of many other societies. At the Atlanta meeting of the American Medical Association he was chosen to deliver the address on State medicine at the semi-centennial meeting in Philadelphia next year.

He married in 1855 a daughter of Jared Collins, of De Soto County, Miss. His widow and two living children, Edmund Collins and Jerome Bowling, both business men in Houston, Texas, survive him.

NEW BOOKS AND BOOK REVIEWS.

MEDICAL AND SURGICAL REGISTER OF THE UNITED STATES, Fourth Edition, pp. 2351, 1896. R. L. Polk & Co., Detroit, Mich.

This is a progressive work of great magnitude, as compared with other medical registers. It purports to give the names and post office addresses, colleges, and dates of graduation of over 106,000 physicians practicing in the United States and Territories, together with the populations and other data of their several localities. It also comprises a list of all the medical colleges and other medical institutions, hospitals, asylums, sanitariums, etc.; medical and sanitary societies and organizations; laws regulating medical practice; list of medical journals with the names of their editors, places and terms of publication; roster of the medical officers of the Army, Navy, Marine hospital service and pension services, with needful information to candidates who would enter the public service. Moreover, it is not only a gazetteer of localities—in relation with the residences of physicians—but of the United States and Territories generally, and in connection therewith, shows the educational facilities, meteorological conditions and mortality statistics, as summed up from the most recent official records; altogether constituting a work of great practical utility to all who would know about physicians and their interests.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE STATE OF NEW YORK, 1896, pp. 542, Frederic C. Curtis, Secretary, Albany, N. Y.—An admirably gotten up volume, as usual. It comprehends about thirty stated papers and reports on practical medicine and surgery, and half a dozen on preventive medicine. Of the latter the most important is on *Drinking-Water and Diseases*, an abstract, by William P. Mason, M. D., whose recent work on Water Supplies was reviewed in our August number. It is a lucid abstract, of practical importance. *Shall the State Undertake to Restrict the Spread of Tuberculosis?* by John L. Heffron, M. D., is a brief paper, emphasizing the infectious nature of tuberculosis and its dangers, and strenuously urging an affirmative reply to the question of his discussion. *Serum-Therapy*, by E. H. Wilson, M. D., is a lucid sketch of the advantages of serum-therapy, as shown by the greatly reduced mortality of diphtheria by it. *The Symptoms and Diagnosis of the Indigestion of Starchy Food*, by Reynold W. Wilcox, M.

D., is an old subject, cogently treated under the light of recent experimental knowledge, very clearly describing one of the most common causes of dyspepsia. *Alcoholism and Public Health,* by Henry R. Hopkins, M. D.: "What is alcoholism? Who are the victims of alcoholism? What is the relation of alcoholism to public health? What responsibility, if any, rests upon the medical profession regarding the matter of alcoholism? What is the duty of the Medical Society of the State of New York, at this meeting, upon this question?" With these interrogations as a text, the author seems to take it for granted that all except the last may be passed over—left to the common sense of every intelligent observer —and he at once proceeds to condemn the "scientific temperance" act of the Legislature of 1895, as it deserves to be condemned, an act alike disgraceful to the so-called "scientific temperance party" that devised it and the Legislature that passed it. It provides that even "pupils unable to read shall be instructed orally" the "nature of alcoholic drinks and other narcotics." And this, the essayest rightly says means that such pupils are to be taught chemistry, both inorganic and organic, or at least so much of chemistry as will put the pupil abreast of the knowledge of the various alcohols, alkaloids, ethers and other chemical substances found in "alcoholic drinks and other narcotics." The requirement of the law is that the subject shall be given at least four times a week for a period of ten weeks during the school year. Other absurdities of and objections to the law are stated, and then follows a review of the books that have been introduced into the schools in virtue of the law. They are shown to be unscientific and fallacious—alike inconsistent with a knowledge of physiology and hygiene, as the law is with practical education. With such a showing, the duty of the Society was manifest.

Annual Report of the Illinois Society of Engineers and Surveyors, being the proceedings of the Society at its eleventh annual meeting, held at Galesburg, January, 1896. Price, 50 cents. John W. Alvord, Secretary, Chicago. A pamphlet of 234 pages, comprehending committee reports, papers and discussions on garbage disposal, water supply, land drainage, sewage irrigation and kindred subjects of practical interest to all sanitarians.

Report of the Results Obtained with Experimental Filters, at the Pettaconset Pumping Station of the Providence Water Works. By Edmund B. Weston, member of American Society of Civil Engineers; member of the Institution of Civil En-

gineers of Great Britain; Assistant Engineer in charge of Water Department, Providence, R. I. An illustrated pamphlet of 181 pages, defining and describing natural and mechanical filtration and filters, and the results of experimentation by the use of chemical tests, bacteriological cultivations and counts. The filters and filtering media are shown by engravings, and the results tabulated; gallons of water filtered per acre, per 24 hours; bacteria, per cubic centimeter; per cent. of the applied bacteria removed; average percentage of the applied bacteria removed; grains of sulphate of alumina used per gallon. The various conditions of the filter beds, previous to and subsequent to cleansing and removal, different temperatures of the applied water, with and without the addition of basic sulphate of alumina, etc., are comprehended in the scope of the experiments and the results shown. Altogether it is a report of much practical utility on a timely subject.

SERO-THERAPY IN TUBERCULOSIS, a pamphlet reprint from the Journal of the American Medical Association, by Paul Paquin, M. D. It comprises the experience of several physicians with the use of the anti-tubercle serum as prepared, and for some time urged by Dr. Paquin. The results of this experience are well calculated to encourage Dr. Paquin, notwithstanding several committee reports against the utility of the anti-tubercle serum. There is no room to question the reliability of the reports here summarized. They are by physicians of good standing, with no other interest than the welfare of their patients. In the discussion which followed the reading of the paper* Dr. A. M. Hayden, of Indiana, said:

"I have obtained the very best results in eight cases out of ten. The question most important to settle at the present time is, what cases will be benefited, and under what circumstances, and how to distinguish between cases which will be benefited and those which will not, I have been unable at the commencement to decide. A case in mind was that of a patient having an immense cavity in the left lung. Apparently he got no benefit from the treatment the first three weeks, but had the flushed face, disturbance of circulation, and seemed to lose ground for a month. But on examining the sputum we found the tubercle bacilli were diminishing. After thirty days the tubercle bacilli was very much diminished in the sputum, and he began to gain in strength, appetite, flesh, etc. In three months the tubercle bacilli had disappeared from the sputum,

* In the section on Practice of Medicine, at the meeting of the Association, at Atlanta, May, 1896.

although they had been very numerous on the microscopic slide at the first. He had had hundreds of hemorrhages, and could not go out of the house alone. The other lung has cleared up, the chest wall has contracted over the cavity, he is at work and enjoying life. In one or two other cases there was improvement the first two or three weeks. Then it ceased and they lost ground. In 80 per cent. of my cases the results obtained have been better than those I have ever succeeded in getting from any other therapeutic agent. I discontinued all other treatment in these cases in order to give the serum a fair trial. One man whose condition was regarded as hopeless would take no other treatment, and the result was so favorable that I abandoned all other measures while using the serum. The man whose history was sent Dr. Paquin, and who had tuberculosis of the glandular system, coughed, was emaciated, had swollen feet, pulse 140, night sweats and insomnia. Everything else was stopped and he was given the serum. At the end of sixteen days he had improved sufficiently to get out of bed and had gained a number of pounds. The treatment was discontinued ten days or two weeks; he began to feel badly again, and another ounce of serum was sent for; soon afterward his weight increased to 170 pounds, and since then he has gained five pounds more, being heavier than he had ever weighed before. One of my patients who did not improve had mixed infection, and I believe it will be found that such cases are less likely to be benefited than those with purely tubercular infection. The other case which apparently improved at first, but relapsed afterward, was one of laryngeal tuberculosis. It is a peculiar fact that most of the cases in which I got good results did not seem to improve at first, whereas the two which at first showed improvement of appetite and some gain of flesh, afterwards relapsed."

A dozen others have had alike favorable results.

CONTEMPORARY LITERATURE.

NEW YORK'S CLEAN STREETS.

New York in May had a lesson for itself, which is of value to all American large cities, in the parade of Colonel Waring's entire department and machinery for cleaning the streets of the city. It was a lesson in organization and discipline of the highest importance. The display itself, in order and appearance, would have been creditable to a body of a more military character. The citi-

zens knew that their streets had been kept clean as never before, and they appreciated the achievement; but they learned by this parade that this had not been accomplished by any haphazard method, but by perfect organization, and the cultivation of an *esprit de corps* that pervaded the whole department. Here was really a creation of a new force in the city, applied to its ends and kept up to the mark by discipline. Putting the force into uniform had much to do with it. The men in line, the sweepers and cartmen, and even the juvenile clubs the commissioner had organized and inspired with a love of New York and a pride in having it clean, had a consciousness of place and of service that made them all, old and young, better citizens. Even the humblest service becomes ennobled by the manner in which it is performed. New York has long had a street department. It was an original discovery of Colonel Waring's that this could be made and used to clean the streets. The parade showed that the result was attained by brains and discipline.—From "Editor's Study," by CHARLES DUDLEY WARNER, in Harper's Magazine for August.

CARELESSNESS OF LIFE IN AFRICA.—Mpimbi is the beginning of the navigable water used by the administration at Fort Johnson. The river is full of crocodiles; people are constantly being taken by them. Hoare shot a big crocodile, and found a pair of bracelets in its stomach. The natives foolishly risk the water every day. They walk in knee-deep to get water, and even swim across the streams. By making a small fence about the place where they get water many lives would be saved; but that means work, and each African thinks he will not be a victim.—[From the Diary of the late E. J. GLAVE in the August Century.]

GOOD AS WELL AS BAD IN EVERYONE.—I have contended that there are good tendencies as well as bad in everybody, and that the two extremes of the social scale are not *inherently* so very far apart in a moral way. But it is conceded that the conscience—the moral sense—reflects the individual environment. It will further be conceded without argument that the time of plasticity during which conscience is forming is the childhood and adolescent period of the individual. Now, what is the environment in which these habitual criminals are usually reared? Why, an environment of crime. Jeers and curses are the first sounds to greet the infant's ears. By example, if not by precept, it is taught that the object of living is to secure as much as possible from one's fellows with the least possible return; that sin consists in being found out; that a

successful and undetected crime is the most laudable of acts. Wax to receive, marble to retain, that young mind was graven deep with the lines of wrong living. A subtle poison permeated every cell of its body; what wonder if it thenceforth gave out none but poisoned thoughts? It were contrary to all experience to expect it to do otherwise, for the environment which counts in moulding us is that with which we come in immediate contact during the formative period of life. The highest thought, the most elevated morals, of any generation, are, in a sense, the hot-house cultures of that generation. Just in proportion as they rise above the average understanding and morality of the time, they tend to become unstable. The lower, the more primitive, instincts lie deeper in the grain of the organism. Left to itself, the organism will revert to them as surely as the hot-house plant run wild reverts to its primitive forms. In the one case just as much as in the other, careful training is necessary if the best result is to be obtained. The flowers of the human mind do not bloom on human weeds.—From "Can the Criminal be Reclaimed?" by Dr. H. S. WILLIAMS, in North American Review for August.

THE GENIUS AND THE CRANK.—The genius is the man who has, occasionally, greater thoughts than other men have. Is this a reason for excluding him from society? Certainly not; for by great thoughts we mean true thoughts, thoughts which will work, thoughts which bring in a new era of discovery of principles, or of their application. This is just what all development depends upon, this attainment of novelty, which is consistent with older knowledge and supplementary to it. But suppose a man have thoughts which are not true, which do not fit the topic of their application, which contradict established knowledges, or which result in bizarre and fanciful combinations of them; to that man we deny the name genius; he is a crank, an agitator, an anarchist, or what not. The test, then, which we bring to bear upon the intellectual variations which men show is that of truth, practical workability—in short, to sum it up, "fitness." Any thought, to live and germinate, must be a fit thought. And the community's sense of the fitness of the thought is their rule of judgment.—From "The Genius and his Environment," by Prof. J. MARK BALDWIN, in Appletons' Popular Science Monthly for August.

THE BARNARDO HOMES FOR CHILDREN.—It was said that the State was rearing its daughters for the streets and its sons for the jail. Hideous stories were whispered as to little ones blinded for

life by State-caused ophthalmia. And as these rumors spread from mouth to mouth, Parliament was at last induced to inquire into these matters, and the Local Government Board appointed an official departmental committee to look into these matters. The report of that committee, published this year, settles the controversy once for all. After all these years the State is compelled to admit that it was wrong—utterly, horribly, shamefully wrong—and that Dr. Barnardo was right, absolutely right, in his theory of the way in which the children of the State should be treated. So now the district school is doomed, and in future the State, sitting at the feet of Dr. Barnardo, is to try to see whether by segregation instead of aggregation, by homes instead of barracks, by personal love and personal interest instead of official routine and official discipline, it may perhaps achieve with all its resources 50 per cent. of the good results of the Barnardo Homes. But what of the scores of thousands of children of the State who have morally, socially, and often physically perished before the State could be induced to admit that it was mistaken?—From "Dr. Barnardo, the Father of 'Nobody's Children,'" by W. T. STEAD, in August Review of Reviews.

WHERE DEATH NEVER COMES.—Mrs. Eliza Ruhamah Scidmore writes a paper entitled "'An Island Without Death" for the August number of "The Century." It is devoted to the Island of Miyajima, one of the three wonders of Japan. Mrs. Scidmore says:

It is a strange little village, where no wheel ever turns, where no fields are tilled, and where the religious rules of so many centuries have forbidden deaths or births to occur, many a soul entering and leaving the world in a boat that hurriedly bears them over to the Aki shore. The tiny village of Ono, in a crevice of the opposite Aki hills, shows from the island its cremation temple and graveyard, where generations of Miyajima people have been laid away, and the little thatched dwellings where Miyajima mothers remain until their infants are thirty days old, when they may be taken back with rejoicings for their first ceremonial visit to the great temple.

HINTS ON SWIMMING.—The beginner should not try to swim any long distance at first. As soon as he finds that he can keep his body floating easily on the water by means of the strokes he has learned, he should aim to perfect his form rather than aim to cover long distances. The stroke which has just been described is technically called the forward breast stroke, and although there are a

great many other kinds of strokes in swimming, this is the easiest of all strokes to learn, and the one that is most generally used, except, perhaps, for racing.

One of the most common of the fancy strokes is the overhand stroke. This is performed by placing the body on the right side, with the legs held out behind perfectly straight. One leg is then brought up in front and the other is lifted up behind, and the next motion is to bring them together with a swift, scissorslike motion, exerting as much force as possible. In the mean time the right hand is moved out in front and brought down through the water as far as the left thigh, while the left hand passes out of the water from the rear forward, and is drawn back similarly through the water, thus pulling the body ahead, just as one might pull one's self along by means of a rope.—*Harper's Round Table.*

A BURDENSOME BENEFACTRESS.—The town of Whiteridge, N. H., was cursed with a benefactress. She was a little old non-resident widow, with granite insides, a native of Whiteridge, married early to a Boston merchant, and now desirous of linking her name perpetually with that of her birthplace. She had presented the township with the Martha J. Torringford townhall, the village with the Martha J. Torringford drinking-fountain, and the Congregational Church with the Martha J. Torringford parsonage, all upon conditions stated by herself. The hall was fine to look upon, but the use of tobacco was forbidden in or about the building, with the result that the voters of Whiteridge seriously thought of holding the March meeting, as usual, in the old hall above Alvah Bayley's general store, where the genial sawdust covered the floor at town-meeting time, and the women-folks had nothing to say about anything. The drinking-fountain was just too low for a horse, unless he were unchecked—the donor took this means of combatting the pernicious check-rein—and just too high for a dog. However, this was immaterial, as the town had refused to bond itself for a water system, and the dust of two summers lay thick in the great marble bowl.—From "By the Committee," by BLISS PERRY, in the August (Fiction) Number of Scribner's.

AN OLD FAVORITE WITH NEW FEATURES.—It is announced that the publishers of the old Standard eclectic weekly, *Littell's Living Age*, founded by E. Littell in 1844, are about to introduce several new and valuable features in their magazine. The most important of these is a Monthly Supplement, given without additional cost to the subscribers, which will contain Readings

from American Magazines, Readings from New Books, and also a list of Books of the Month.

It is also proposed to extend their field by giving occasional translations of noteworthy articles from the French, German, Spanish and Italian reviews and magazines.

A year's subscription to *The Living Age* will then include more than thirty-five hundred pages, filled with the best things in current periodical and general literature, and making four large volumes, for only six dollars.—THE LIVING AGE CO., Boston, Mass.

THE SIGNIFICANCE OF A NAME.

The *United States Life Insurance Company* in the city of New York invites the attention of its agents and others to the insidiousness and mischief of false colors, as follows:

NEW YORK, Aug. 12, 1896.

Gentlemen,—We quote you the following, which appears in to-day's issue of the New York *Times:*

"WOULD WIND UP ITS AFFAIRS.

"State Superintendent of Insurance Reports on United Life Association.

"ALBANY, Aug. 11.—State Superintendent of Insurance, James F. Pierce, to-day transmitted to the Attorney General the examiner's report in the matter of the *United Life Insurance Association of New York City*, asking that he take such action that the affairs of the association would be wound up at the earliest day possible.

"The association has been given ample opportunity by the department to present some feasible plan which would prevent the necessity of this action, but up to date has been unable to do so.

"The examiner's report shows that on the 23d of July the association had actual assets of $2,552.49, with total liabilities of $61,585, and contingent liabilities of $119,250."

Most of you are aware that at various times we have suffered more or less injury by the confounding of our corporate title with that of the company referred to above, and others whose titles are somewhat similar to ours. Not only has this misapprehension existed among agents and policy-holders, but we have even at times been incautiously injured by unverified reports quoted in the insurance press in which the United States Life Insurance Company

was very inconsiderately credited with the evils and shortcomings of certain assessment associations whose names bore a close similarity to ours.

We think that the matter thus brought carefully to your attention will enable you to guard us very largely against the consequences of any misapprehension that may be made by agents of other companies who may injure us by simply being careless in their references.

We propose to send a copy of this to the insurance press so that they may take such precaution as they deem necessary to avoid attributing to us the shortcomings of others.

GEORGE H. BURFORD,
President.

PAMPHLET REPRINTS, REPORTS, ETC., RECEIVED.

Insanity Law of the State of New York, 1896. T. E. McGarr, Secretary. Albany, N. Y.

The Sanitorium, or Closed Treatment of Phthisis. Edward O. Otis, M. D. Boston, Mass.

Physical Examination of the Chest. Andrew H. Smith, M. D. New York.

Retinitis and Choroiditis. L. Webster Fox, M. D. Philadelphia, Pa.

Intra-Ocular Growths. Ibid.

Implantation of a Glass Ball in the Orbit after Enucleation of an Eye. Ibid.

Valedictory Address to the Graduating Class of the Medico-Chirurgical College of Philadelphia. Ibid.

Operations performed in the Eye Department of the Medico-Chirurgical Hospital, Philadelphia. Ibid.

A Tribute to the Memory of Edward Jenner. Forty Years of Personal Experience in the use of Vaccination for the Prevention of Small-pox. C. N. Hewitt, M. D. Red Wing, Minn.

Should the Cardiopath Marry? William T. English, M. D. Pittsburg, Pa.

Lycopersicum Cardiopathia. Ibid.

Ophthalmia Neonatorum. William Cheatham, M. D. Louisville, Ky.

Some Conclusions Drawn from Experiences in Pelvic Surgery. A. V. L. Brokaw, M. D. St. Louis.

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NUMBER 323.

SANITARY PROGRESS.*

BY CHARLES H. SHEPARD, M. D.,
Brooklyn, N. Y.

The amount of useful information that has been diffused from this Section since it was first organized, has been possible only by the indomitable energy and self-sacrificing work of those who have labored in its field. They have plowed and sown, and while we gather the fruit of their labors, it is also incumbent upon us to do our share in the promotion of the work.

Unfortunately, outside of the medical profession, but comparatively few minds are possessed of a practical knowledge of sanitary matters. Hence the necessity of continually reiterating and disseminating what many of us consider the most commonplace truths, until their full acceptance shall render our land a sanitary Eden.

The healing of disease is a most noble work and worthy of all praise, but he who teaches how to prevent disease is engaged in a higher and holier cause. It is not a question of how far it is well for one to go in destroying his own business, for the lover of his race realizes that his highest interests are bound up with the welfare of the people.

We are now in the kindergarten state of knowledge regarding many of the most important sciences that bear upon the prevention of disease. Far reaching as recent developments appear to be, the glory of those yet to come will undoubtedly cast these into the shade in the not distant future. It is a matter for which to be thankful that one is able to devote a life to

*Abstract of Chairman's address in the Section on State Medicine, at the Forty-seventh Annual Meeting of the American Medical Association at Atlanta, Ga., May 5–8, 1896.—From the *Journal*, August 8, 1896.

the advancement of ideas that may prove of incalculable benefit to mankind.

For ages men have sought for a panacea. New remedies are constantly urged for public favor with surprising rapidity, and are popular for a time, only to be displaced by newer ones. Strive as we may, we are convinced that never will a remedy be found to obviate the penalty sure to be exacted by violated law. Preventive medicine will teach people how to live, and then ignorance and panaceas will die a natural death. This is worthy of the earnest attention of the ablest minds, and will produce most important results. The loss of time on mere effects, instead of the original causes of disease, is like giving attention to the branches, instead of striking at the root of the deadly upas tree.

The ideal physician would be the State physician, whose position and income assured, would enable him to devote his entire time and best powers in seeking the highest interests of the community in the prevention of disease.

The first knowledge on preventive medicine was promulgated and practiced by Moses, the great lawgiver. Granting all that is claimed for antitoxins of various kinds, and for vaccination as a preventive of smallpox, these are but so many milestones in the progress of preventive medicine since his day. Diphtheria, scarlet fever, etc., are filth diseases, more or less subject to the same measures as he applied to plagues — isolation and cleanliness. Preventive medicine will eventually enable us to avoid all filth diseases of whatever kind.

As Rome carried civilization with her conquests, so shall preventive medicine, and this Section, as its representative in the American Medical Association, continue to diffuse a saving knowledge of human life.

It is well to look back occasionally, in order to measure our progress. Among the subjects which have been advocated by this Section were soil drainage and improved systems of sewerage, the better housing of the poor in our cities, the registration of vital statistics, civic cleanliness, quarantine reform and, more recently, improved pavements and public baths.

History tells us that sanitary measures, methodically carried out, are invariably followed by improved public health and a decreased death rate. But for the important sanitary measures carried out by the rulers of Rome, the eternal city would never have become the mistress of the world. Had it not been thor-

oughly drained, a large part of it would have been uninhabitable. The sanitary works of Rome, introduced when she was at the acme of her glory, have been a model for ages past, and will so continue for ages to come. Her enormous aqueducts, particularly those built by Agrippa, were virtual rivers brought into the city to flush the streets and sewers, and to supply all public and private requirements.

Before the streets of London were paved the inhabitants were as great sufferers from periodic fevers as are those of the most unhealthful rural districts in our own country. It has been computed by an eminent authority, Sir Lyon Playfair, that in one county alone in England, the pecuniary burden borne by the community in the support of removable causes of disease and death, amounted to the annual sum of twenty-five millions of dollars.

After the paving of Dijon, the ancient capital of Burgundy, in the middle of the fourteenth century, dysentery, spotted fever and other diseases, became of less frequent occurrence in that city.

The evils of a certain form of modern architecture in our cities is a growing one that should be thoughtfully considered. The crowding together of tall buildings, depriving the lower floors of proper sunlight and ventilation, is one of the modern aggressions that is not of unmixed benefit, even in a business sense, involving the health of the occupants of all such buildings. The deficiency of sunlight and insufficient ventilation common to these structures, seriously affects the eyesight of multitudes, and the depressing effect of confinement and labor in the vitiated atmosphere, under such circumstances, render the occupants subject to temptation for tobacco and other narcotics to appease the craving for the healthful stimuli of fresh air and light. The height of buildings should be in proportion to the width of the street. As a prominent and conscientious architect, Ernest Flagg, has well said in the May number of the Cosmopolitan: "It is best in this matter to place a curb upon private greed for the public good."

The disposal of the sewage of cities is a subject that is demanding more and more attention. That which now goes to waste, to the pollution of rivers and to the obstruction of harbors, is a constant menace to health, besides being a pecuniary loss to the community. Sewage should instead be so disposed of as to be devoid of danger, and a profit to the city.

From its noiselessness, cleanliness, and consequent comfort, the improvement of street pavements by the use of asphalt is inti-

mately related to the health of the community, and this was strongly urged by Dr. Bell, in the *Sanitarian*, over thirteen years ago. It is now rapidly growing in favor, and making way for the horseless carriage which is to banish to the country districts the horse and his unsanitary surroundings.

It is proper here to refer to the *Sanitarian*, the foremost journal in this country devoted to sanitary subjects, as the source from which I have been able to glean many facts on the progress and present status of preventive medicine, and also to the editor who projected that periodical in the same year that this Section was organized, and of which he was the first chairman twenty-three years ago. This publication presents essays by the most distinguished sanitary authorities on a great variety of subjects, and the gist of sanitary medicine in all its phases.

Dr. Bell's activity as a sanitary reformer prevented the yellow fever from reaching the city of Brooklyn from Bay Ridge and Fort Hamilton in 1856. He fought against the quarantine system as it then obtained, and succeeded in reforming it on the basis of the regulations which he devised and reported to the National Sanitary Convention in Boston, in 1860. He devised measures in detail relating to departure, as the primary means of preventing the conveyance of infectious diseases from one place to another, and their introduction into new places. Moreover he instituted and successfully practiced, under the auspices of the National Board of Health, measures which prevented the yellow fever from being conveyed to other places from New Orleans, in 1879, without restricting commerce, and with the result of raising all the quarantines against that city within six weeks.

In a contribution to the Report of the New York Board of Charities for the year 1876, on the "Relation of Unsanitary Conditions to Pauperism, Vice and Crime in New York," Dr. Bell suggested a mandatory law requiring assessment, seizure and destruction, at public expense, of a stated few of the worst tenement houses in the city and the conversion of their sites into grass plots, annually, as an efficient means of reform; means that would not only weed out the worst from year to year, but continually promote the improvement of the remainder, whose proprietors would not allow them to be destroyed. The legislature has but recently conferred the power of so doing, in a modified form, on the health authorities.

Municipal sanitation in New York and Brooklyn on a scientific basis began thirty years ago, under the auspices of the Metropolitan Board of Health. The average death rate in New York, per thousand of the population, for the ten years preceding that date was 33.39; for the first ten years following it was 29.70; for the ten years ending December 31, 1894, it was 25.48. Surely it would be difficult to find more significant results of practical sanitation, equivalent to saving of about eight lives per 1,000 of the population, annually, and amounting in the aggregate, measured by the present population and death rate, to 14,464 lives annually.

One of the most imperative necessities for preserving the public health is an ample supply of pure water, and it is to be hoped that some better means than lead pipe will soon be found for conveying drinking water through our houses. The more pure the water the more it acts on the lead to absorb the poison, and therefore it becomes the more dangerous. Possibly aluminum may come in to supply this pressing need.

The character of the public water supply is the first and chief concern of every intelligent sanitarian, for if unprotected it is liable to become the means of transmission of many infectious diseases. As population increases the sources of contamination multiply and it becomes more and more difficult to secure an abundant supply of pure water. Rain water falling upon the earth's surface becomes more or less contaminated from the soil, with mineral matters, which it holds in solution, and should be used with caution. Many of the epidemics that have desolated different countries have been caused by the use of impure water. Cholera, typhoid fever and dysentery are fostered and disseminated almost exclusively through the medium of drinking water.

It would be a profitable investment for any city which is suffering by reason of a polluted water supply to expend all the money that may be required for the substitution of a wholesome supply, either by going to new sources or by purifying the supply on hand. This can be demonstrated easily by figures that men of ordinary intelligence would be obliged to accept. The loss to several cities throughout our land from typhoid fever during the past year which has been traced to the water supply has emphasized this fact. A few of the cities have taken up the work of purifying their water by filtration, and in every case the decrease in the death rate has been most satisfactory and justified all the outlay. This is a work that should be carried out by the cities in their corporate capacity

rather than left to private enterprise. Where all are to be benefited all should be interested.

It is but trite to say that the Section on State Medicine has a most comprehensive work on hand, including, as it does, preventive medicine, public hygiene, public baths, street paving, together with cleanliness of the streets, disposal of the garbage, factory inspection, cattle inspection, milk inspection, employment of child labor, cremation, etc. I will trespass on your time only to refer to a few facts in preventive medicine.

The camera and the bicycle, by calling people out into the open air, and giving them pleasant occupation and mental stimulus, is doing more to prevent disease than all the medicine in the land. We should be very thankful for the sudden popularity of the bicycle, in that, besides what it has done in the promotion of healthful out-door exercise, it has given a wonderful impetus to the question of good roads.

The blessings of sunlight and fresh air should be more appreciated. The sun is the godfather of us all. The source of all light, heat, electricity, and energy, what wonder that it was once worshipped as the creator. The future will recognize it not only as the best disinfectant, but also as a wonderful healer of disease. The more people can be taught to live in pure air out of doors, and bask in the rays of the sun, the less of disease there will be.

The Women's Health Protective Association of Brooklyn, N. Y., is doing a most useful work by preventing litter in the streets, by promoting the burning of garbage, and more and above all, in its effort to prevent consumption, by endeavoring to abate the nuisance of expectoration in the public streets and conveyances.

The use of the microscope is revealing new discoveries every year and giving us more and better information in regard to the minutiae of life. The knowledge of microbic life is so intensely attractive as to absorb the whole time of many students, and the wonderful results developed have many times astounded the world, and in many ways helped to prevent disease, by teaching us what to do in emergencies. Yet what is now known should be considered as but the forerunner of what is to come. New facts have been so rapidly developed as to dazzle the imagination with their possibilities.

The X rays, lately discovered by Röntgen, have produced a profound impression upon the public mind. The correct view of this new radiant energy will undoubtedly soon be formulated,

when new experimental data will follow. It may be that the rays will be proved identical in kind with vibrations of light, heat, or electricity. It may be, on the other hand, a new form of energy. It is easily possible that the new photography, when fully developed, may reveal to us secrets of cellular growth, glandular activity, and the like, that have hitherto proved inscrutable. The power of looking through a man, as reported by Mr. Edison, may yet lead to still greater discoveries in the prevention of disease.

No more desirable work has been done by any board of health than in looking after the adulteration of food and medicine, as in Ohio, for instance. Of all the liars in existence, none are worse than those who advertise to furnish food or medicine while they deal out that which is bound to cause disease and leave ruin in its path. If there was a soul above filthy lucre in the patent-medicine vender there would be none of this. To protect the public against such dangers is the god-like mission of State medicine. But when we get pure food, much of it needs cooking, and cooking schools are immensely useful as a preventive of disease, as well as to prevent the waste of valuable portions desirable for the building up of sound tissue of the entire man into his most vigorous condition.

The bad work that people make in dosing themselves with patent medicines and the use of other medicines without a physician's prescription, is not unfrequently punctuated with a sudden death from overdosing with antipyrin, sulphonal, or some other coal-tar preparation. "Children should not play with edged tools." The teachings of preventive medicine should do away with such work.

Another thing upon which it is most desirable that the public should be enlightened, is the imperative need of rest, instead of stimulation. What are called tonics or stimulants are used only at a ruinous expense to the vitality, and if people would take time for recreation and recuperation, they would obviate the necessity for their use.

If our people are ever to be redeemed from the thraldom and unmitigated curse of drunkenness and tobacco using, it must come from the teachings of preventive medicine.

There is an immense amount of ignorance abroad in the community on the subject of health and the proper way of living to secure the best physical condition, and there is a corresponding need for instruction in such matters. One of the most important of all studies for old and young is that of personal hygiene. This it is that protects from personal contagion. This do and thou

shalt live! That do and thy body shall be in a constant state of receptivity for all manner of disease! The earlier in life this difference is recognized the more surely will success crown man's daily pursuits.

In fact, the very best preventive of all disease is a condition of well-nourished physical purity, combined with a mental and bodily alertness that leads to the enjoyment of all good work. Such a one can walk through pestilence unharmed, will live out all his days, and, barring accidents, be gathered in when his full time shall have come, like a shock of corn fully ripened.

The delights of mental pursuits, in calling its devotee out of himself to the attainment of certain truths or facts and the vantage ground gained by every such conquest, giving broader field and more expansive view with intensified joys, place mental pursuits among the more desirable means for preventing disease and prolonging life.

The multiplication of intellectual entertainments and resources, that give the people something to think about and occupy their minds to the exclusion of things of a lower grade, is to be welcomed by all who place a higher faith in prevention than in cure. We very well know that if we can fill the minds of the young with the good, there will be no room for the bad.

Laugh as we may at the vagaries of the teacher of what is called mental science, there is a germ of truth in it. The mind reacts upon the body as well as the body upon the mind. We can magnify or minify our troubles; therefore if weak and delicate invalids can be made to believe that they are to get well, they are thereby in a better condition to become well. So also with one who girds himself up to face disease and disaster. He is by so much less liable to the disease or disaster, and should it overtake him he is better fitted to cope with the emergency.

The little that has been accomplished is but the forerunner of what is to come. The time is not far distant when the people will demand that all these desiderata shall be taken up in a manner commensurate with their importance, and then public baths will be made as free to the people as the postoffice and the public school. Good roads will be uniformly extended throughout our country, and kept in proper condition. Dwelling houses, and business houses as well, will receive their full modicum of sunlight and ventilation, pure water will abound, and excreta, along with garbage, will be disposed of with advantage to the community.

Our public schools will be well lighted and ventilated, the children will be properly taught the evils of the indiscriminate use of narcotics of all kinds, and they will not be overworked by a too cumbersome curriculum.

It will be a happier day for all when the people in their representative capacity shall take charge of all vagrancy, see that all who can labor shall have the opportunity, and those who are disabled properly cared for. This also is preventive medicine, and is but co-operation, wherein the people shall demand reforms to be carried out by the government, which is, or should be, but the expression of the will of the people. Thus will State Medicine fulfil its highest duties. By some this might be called socialism, but the whole world is traveling that road. Our American Medical Association is but a step in co-operation by liberal-minded men, lifting us for the time being out of the slough of unhealthful competition, and our Section on State Medicine is pre-eminently socialistic in that it seeks the benefit of the mass through the power derived from the people in their collective capacity.

If ever legislation regarding public questions shall be elevated above the plane of practical politics or personal gain, we may obtain some results that will help to promote the best interests of the community, instead of, as at present, being made the football of conflicting parties.

But let us bear in mind that we are, in part, at least, responsible for this condition of things, that it is every physician's duty to take an active and intelligent part in all political matters, and not leave them to the intriguers and ignorant. When every intelligent citizen does his part a new era will be inaugurated in practical politics.

A bill has been introduced in the Senate, creating a new cabinet officer who shall be known as Secretary of Manufactures and Commerce, and certainly this is of great importance to all of our industries, but of still greater importance would be a Secretary of Public Health, for if the health of the community is not protected, the industries are of but small account.

While State medicine has saved the world from an immense amount of charlatanism and superstition regarding avoidable disease, there are larger fields and higher ground waiting for occupancy by the interested students who are to bless the community by their new discoveries. The range is too vast for any one department, but all should combine in this effort to promote the health and lengthen the days of man, for all the achievements of

the true physician are the common heritage of mankind, and thus is he to become one of the most potent of all the civilizing agencies of the future. This forward march is to go on, and blessed are we who are permitted to take part in the work, insignificant though that part may be.

During the past year the harvest of death has been very great in the ranks of medical men, particularly among the younger members, leaving gaps that will be hard to fill. The demands of modern society are too exacting, and the results of the pace that kills are sometimes realized too late. From out of our own ranks have gone Dr. Joseph Jones of New Orleans, Dr. James E. Reeve of Chattanooga, Tenn., and Dr. C. G. Comegys of Cincinnati, Ohio, They rest from their labors, and we shall see them no more, but the bright example of their noble work will remain to bless all the land.

REMARKABLE WHOLESALE POISONING.—The Rome correspondent of *The Lancet* relates a curious instance of widespread lead poisoning, especially in Milan, caused in an unusual way. It seems that the sausage manufacturers have to pay the usual tax on salted articles. As an evidence that this tax has been paid, every sausage is ticketed with a leaden seal. When so labelled the sausages are distributed to the dealers, and by the latter are sold to the public, in most cases already cooked, the heavy leaden seal still remaining attached. One may readily divine the consequences. Most sausages contain salts, such as nitrate of potassium, chloride of sodium, etc.; besides this, the intestine used as their envelope is washed with vinegar, or even moistened in wine, which also in turn becomes acidulated—all of them substances which in contact with oxide of lead produce poison of varying intensity. In this state the sausages are consumed by a large public, native and foreign, while the liquor in which they have been cooked—a liquor charged with the salts indicated—is distributed to the poor. It was only after analysis at the municipal laboratory of Milan that the extent of the mischief was realized. The manufacturers are memorializing the communal and civic authorities to replace the leaden seal by another made of some innocuous metal. Meanwhile, the origin of the unpleasant abdominal symptoms, of which there have been so many complaints recently, has now been discovered.

THE HISTORY OF THE PUBLIC RAIN BATH IN AMERICA.

By Herman B. Baruch, M. D.

In an article in the July number of the SANITARIAN entitled "More About the Public Rain Bath in America," which brings into bold relief its great superiority over other baths, that highly esteemed veteran in sanitation, Dr. Moreau Morris, states that in a paper on this subject, contained in the June number, "Mr. Fisk "ignores the instrumentality of the Mayor's Committee in pro- "viding for the construction of the Rain Baths."

This charge is a grievous wrong to a man who is as distinguished for his high sense of honor and justice as for his philanthropic labors in behalf of his toiling fellow men, and I propose to show that it is entirely groundless.

Mr. Fisk has furnished documentary evidence to prove that Dr. Simon Baruch of New York is the pioneer of this great hygienic movement by reason of his writings in the capacity of Medical Editor, by his labors as chairman of the County Medical Society Committee, by his subsequent explanations to the noble philanthropic society which built the first rain bath, by his counsel to all the earlier enterprises of this kind here and elsewhere, by his pleading for this great cause before medical societies, before Health Boards, Mayors Grant and Gilroy, by furnishing material to Mr. Goodwin Brown for demonstrating its enormous import, to legislative committees— in short, by laboring in season and out of season for the furtherance of this great sanitary improvement.

The chief portion of the work of "Introduction of the Public "Rain Bath in America" was accomplished long before the Mayor's Committee was created or even thought of, as is shown by a paper in the SANITARIAN for December 1891, that was read by the Editor at the meeting of the American Public Health Association, two months before, which says: "For the introduction of the Public "Rain Bath in this country the people are indebted primarily to "Dr. Simon Baruch of New York."

Many other publications medical and otherwise could be cited to show that the passage of the "Mandatory Bath Act," which be-

came a law on the 18th of April 1895, was but the consummation of the effort that originated with Dr. Baruch for the "introduction of "the Rain Bath." The following will suffice: The N. Y. Herald of April 21, '95 chronicles the passage of the Bath Bill as follows: "Free public baths and free all the year round. Places where poor "persons may enter and in the utmost privacy bathe thoroughly "with either hot or cold water; houses that shall be open at least "fourteen hours every day in the week, so that any human being "can partake of the advantages of cleanliness. All this has been "assured by the passage of a bill in the State Legislature entitled, " 'An Act to Promote the Public Health,' etc.

"For several years a party of gentlemen, prominent among whom "is Dr. Simon Baruch of No. 51 W. 70th street, have been hard at "work endeavoring to secure legislative authority for the erection "of free public baths by the larger municipalities of the State. Dr. "Baruch and his friends urged action by the various Charitable "Societies, the Board of Health, the Academy of Medicine. Every- "where they met with encouragement. Various charitable societies "built baths under Dr. Baruch's advice and suggestions."

The SANITARIAN for June 1895 comments upon the passage of the Act as follows: "For this salutary act of the Legislature credit "is chiefly due to Dr. Simon Baruch of New York, who has for "several years urged it and meanwhile been instrumental in intro- "ducing the greatly improved system of rain baths in various in- "stitutions in the city. Now that this free boon to the poor has "been secured almost wholly by Dr. Baruch's public spirit and "push, it is gratifying to know that the health departments of both "New York and Brooklyn, and the Boards of Aldermen are act- "ively engaged in measures to render the law effective as speedily "as possible."

Your readers will therefore fail to discover wherein the Mayor's Committee has been ignored in the true history of the "Introduc- "tion of the Public Rain Baths" in America, since this committee was created on July 6th, 1895, hence three months after the pass- age of the mandatory law. The "Construction" of the Public Rain Bath begins where Mr. Fisk's history of its "introduction" ends. The Mayor's Committee was created to "render the law effective."

Dr. Morris states that as a matter of history "it may be of in- "terest to know that the Committee of Seventy authorized a special "Sub-committee to take under advisement the subject of Public "Baths and Lavatories. This committee submitted a preliminary

"report to that body which was finally accepted and enthusiastically endorsed." Where did this committee get its inspiration? Let me quote from its Municipal Leaflet No. 5 on Baths and Wash Houses, written by Jno. P. Faure, Secretary:—"Naturally any preparation "for treating the subject assigned to me this evening compels a "prompt tribute to the research given to it by Dr. Simon Baruch "and grateful acknowledgment is made by me at the outset for "the many extracts taken from Dr. Baruch's admirable paper, 'A "Plea for Public Baths,' read before the Section of Public Health "and Hygiene of the N. Y. Academy of Medicine early in 1891." "As a matter of history" it may also be of interest to state that in the latter part of November 1894, Mr. Jno. P. Faure, the energetic Secretary of the Committee of Seventy, called on my father (who being ill deputed me to see Mr. Faure) with the proposal to become a member of the Sub-committee on Baths and Lavatories. Dr. Baruch expressed his willingness to serve if his individual work then before the legislature would not be interfered with. In reply he received the following letter:

"COMMITTEE OF SEVENTY.

"Secretary's address, 78 Franklin street.

"New York, Dec. 4, 1894.

"DR. SIMON BARUCH:

"No. 51 West 70th street, New York city.

"Dear Sir:

"Your letter of Nov. 26, in response to my call on you, was duly "received, and while it was impossible for those charged with the "formation of the various sub-committees to know exactly upon "what lines they might decide to work, yet it was deemed inexpe-"dient to hamper them in advance with any conditions, and further-"more, knowing your great research of and important labors in "the subject of baths and lavatories, I did not feel at liberty to take "any step that might interfere with the fruition or development of "your ideas, the importance of which are so well known to the "public. While for these reasons we felt ourselves unable to name "you as a member of the Committee, yet I trust that when the Com-"mittee shall have organized it may not be deprived of the benefit "of your presence and suggestions at some of its meetings.

"Yours very truly,

"J. M. FAURE.

"For Committee on Baths and Lavatories."

Taking all the evidence into consideration it would seem that Dr. Morris' contention that "Mr. Fisk ignored the instrumentality "of the Mayor's Committee in providing for the construction of the "Rain Baths" is entirely irrelevant, inasmuch as Mr. Fisk's historical sketch was not on the "Construction" but the "Introduc-"tion" of the Public Rain Bath.

Any rivalry or jealousy among the movers, introducers and promoters of this greatest hygienic movement of the day appears unseemly. Each has labored on his own lines. That Dr. Baruch introduced the public Rain Baths in this country and by persistent agitation has brought it to a practical consummation, is clearly shown by Mr. Fisk's historical sketch, and by the data cited.

It is equally true that the Mayor's Committee is bringing the question of public baths *in this city* to a practical solution by its skill and energy and by its wisdom in selecting good sites and competent architects. This course of the Mayor's Committee is highly appreciated by all who have the interests of this movement at heart and, as I have reason to believe, has given no greater satisfaction to any one than to Dr. Baruch. May the good work go on and all its participants strive only to be emulous in bearing an active share in its achievement and full comsummation

HERMAN B. BARUCH.

NEW YORK, September 28, 1896.

THE DANGER OF WORK IN MATCH FACTORIES.—For the protection of their health, Mr. Edwin Gould has been trying to induce the employes of his match factory in Passaic, N. J., to have their teeth properly cared for, merely for their own comfort and safety. The inhalation of the fumes of sulphur and phosphorus is likely to affect the teeth and develop painful and dangerous diseases. With this in mind he engaged a reliable dentist to examine the teeth of all employes free of charge. The dentist reported that 83 of them had teeth which needed attention. It was then announced that these employes must have their teeth attended to and deliver at the office a certificate of their condition from some dentist. To this there were no replies. He subsequently announced that all certificates must be in by a specified time, but without any threat to enforce the matter. The danger, he urged, is serious, and his only motive has been to prevent suffering. But, with few exceptions, the girls appear to think that their teeth are not worth preserving. ED.

THE INDIAN SCHOOL IN RELATION TO HEALTH.*

By Dr. Martha M. Waldron, Resident Physician of Hampton Institute, Hampton, Va.

The experience of the Eastern school physician is limited in comparison with that of workers upon the reservations; yet the limitations are to a degree offset by the advantage of constant observation and control of a small number. Since taking medical charge at Hampton, fifteen years ago, 836 Indians have been under my care, from many different tribes and agencies; originally, chiefly from Dakota and Indian Territory, but, in later years, largely also from the New York and Wisconsin reservations, and from North Carolina.

One encouraging point may be noted, to begin with: the phycical condition of Indian pupils on arrival at Hampton has very greatly improved within the past six years. This improvement is due to various causes, but chiefly to the fact that Indians are now seldom brought directly from the camps, but from the schools, where they have been clothed, protected and taught, as it was impossible for them to be before there were so many workers and such systematic organization.

All diseases due to neglect must diminish in proportion as the work of the field matron and school progresses, and the diseases due to neglect embrace nearly all that exist. The neglected colds of childhood lead to consumption in the adult, and what is called the natural tendency of the Indian to consumption is doubtless, in many cases, the natural result of the unnatural neglect of little children. Two-thirds of all the superficial diseases of the eye are due to nasal disease, and a large proportion of the cases of nasal disease are due to neglected colds.

The habit acquired by untrained children often predisposes to disease; for instance, the habit of mouth breathing. The danger attending this habit has become well known in late years, through the work of specialists in throat, nose and ear diseases, but, comparatively recent experiments have shown an added reason for the

* Read at the Convention of the Indian Educational Association, at St. Paul, Minn., July, 1896.

strict training of children in this respect. It has been shown that the human nose is an almost perfect filter for micro-organisms. The mouth breather, therefore, is deprived of his natural protection against the bacteria of disease. The correction of this one habit, which, unless attention were called to it, might escape observation, would save many a child from deafness and catarrhal trouble; in short, from dwarfed and miserable life. An earache, also is a matter of sufficient importance to demand and receive serious consideration. The ears and throats of children should always be carefully protected in severe weather. No treatment, however skillful, can rob nasal catarrh, with or without its secondary effect upon the brain, of its horrors. An ounce of prevention in this case is worth untold weight of cure.

The work of the schools, then, in the words of their chief, is "to teach the children to know, in order that they may know how to live right." Right living is the only road to long living, or to useful living, and the hygiene of the school room, the dormitory and the workshop is of more vital importance to the Indian child than to the child of any race further advanced in civilization, and hence of greater physical stamina. The tendency of the Indian to consumption must not for a moment be forgotten in this stress of his transition period. The foundation of a sound constitution is, to a child, of more importance than an elementary education. Without health education can avail little. Food, work and play are the forces with which we can raise a good physical structure. The subject of food has been so carefully studied and so much has been written upon it, that it is an easy matter for anyone to make a suitable and economical dietary for these cases. In the matter of work and play experience must still be the guide, and its light should be very conscientiously followed. A regular civilized life gives a degree of life force, of which the Indian of the West has been to a great extent robbed by reservation conditions and restrictions.

The health rate at Hampton has risen in proportion with the number of students brought from advanced schools and from agencies where there has been, for at least the lifetime of our pupils, a Christian and school influence, and a mode of living approaching civilization. The health of the Oneidas, as contrasted with that of the Sioux, who are behind them on the road to civilization, illustrates this fact, as also the health of the Cherokees. Out of eighty-eight Oneidas and thirty-three Cherokee students, not one has died at Hampton, and only one after return home. The same

is true of Indians from the New York reservations. In several cases these Indians were unsound on arrival, with incipient phthisis, or more or less active scrofula. Pulmonary hemorrhages occurred in some cases, while the students were in school, but all responded fairly to treatment and improved and finished the course satisfactorily, where an Indian from Crow Creek would have died.

The work of the school, then, is to build up from the beginning "the whole child;" to expiate the sins of the past by heroic work in the present.

Free gymnastic exercises and breathing exercises, introduced into the class room work, would be very helpful to these students to relieve the tortured muscles unaccustomed to long sitting, to expand the poorly developed chests and to form a habit of quick obedience. From a teacher's standpoint it might seem a doubtful expenditure of time to introduce a ten minute gymnastic exercise between recitations, but the drill would be very beneficial, and progressively so, as the students advanced in years, and became able to take more complicated exercises. This would, in a measure, take the place of a military drill, where that is impracticable, though I believe that something like a military inspection is always possible and always healthful and should be recommended both for

MORAL AND PHYSICAL REASONS.

Through gymnastic exercises a symmetrical development would eventually take the place of the rather dangerous proficiency which the Indians attain in certain special directions.

Even Indians who are born with an apparently fine physique are often the victims of inherited disease, and many others who have naturally a fine muscular development are unsound from a strain in foot-racing, ball playing, wrestling or other excessive exertion. To illustrate: One broad shouldered student who suffers constantly from cardiac and pulmonary disease says, "I run foot-race, mile and half, I take first prize." His trouble began with that foot-race, and his case is a typical one. A fatal hemorrhage has often been brought on by the violent exertion of these untrained athletes.

Not only would gynastic training produce a more symmetrical physical development, but also the self-control and precision of muscular movements gained by even an elementary gymnastic drill, would undoubtedly have a subjective influence and result in

a firmer moral and mental poise. The more complicated exercises require close and quick mental application to co-ordinate movements, the muscle responding to the nerve, the body to the mind.

The introduction of kindergarten methods is the first step in a course which, if fully developed, would result in the highest degree of self-control.

The ventilation of class-rooms is a common and important subject for discussion. It is often difficult in climates where high winds prevail, to secure ventilation without dangerous draughts. I have found very useful a sliding screen, used in some of the New York hospitals. It consists simply of unbleached cotton cloth, stretched on a frame which is made to slide easily with a spring, in front of the window. It occupies the space of a half window. When slipped over the top sash the window behind it can be lowered as much as desired, or if over the bottom sash, the lower window can be raised. The air enters freely through the cloth, but there is no draught, even directly under the window. This is an excellent arrangement for the school-rooms and hospitals. Another good arrangement for temporarily ventilating, as in a dining room, is made by adjusting a board eighteen inches wide to the upper part of the window frame. The lower edge is brought as closely to the window as possible without interfering with its to and fro motion, and the upper edge, which should extend an inch above the top of the window, is turned outward at an angle of forty-five degrees. When the window is drawn down, the wind blowing in strikes the board, and is thrown upward and toward the center of the room, instead of directly down upon those sitting below. Either one of these arrangements is very good for sleeping rooms, the ventilation of which is of the greatest importance as they are often the rooms for sick and well together.

With the majority of Indians consumption is a familiar evil. A great impetus to hygienic living will have been given when they can be made to believe that cleanliness, air, light and sunshine are so many weapons against

THEIR HEREDITARY ENEMY.

The tubercle bacillus cannot grow without soil. What the white man, at the height of his civilization, is beginning to believe his safeguard, is the only hope of the Indian. Positive, explicit directions as to cleanliness, sanitary conditions and all that pertains to wholesome home life, as they can now be given in the

home by the field matron, will give the children a chance to grow up without being poisoned from babyhood by the exhalations from sick beds, and the floating germs of tuberculous patients. The people must be taught that dust and dirt are disease-carriers to be feared.

In the days of comfortable wigwams, good food and boundless hunting grounds, consumption had little soil to grow in. The log cabin and reservation life have produced the tubercular diathesis. The way of escape is by education and experience which will lead to more wholesome living. Christian civilization is the best therapeutic measure for the Indian.

In being what he is, the Indian simply shows the powerful effect of heredity and environment. The wonderful influence of these forces is best seen in their effect upon the Indian race, from the fact that the complex influences of civilization do not enter into the account. For example, in the case of the Apache, the weakening process has acted through but one generation, yet the physical retrograde from the mountain Apache to the child of the prisoner of war, is immense. Yet in this is our hope; what heredity and environment have done, heredity and environment can do. Make the environment healthful and the child will be healthy. The past, with its mistakes, is behind us; the present and all the future is ours. Let any one who wonders why Indians have little physical endurance, read the account of the transportation of the Sioux from Fort Snelling to Crow Creek, S. D., in 1863, during which river journey of one month 300 out of 1,300 human beings crowded on to one small steamer, died, and let that and the immediate subsequent history of the Crow Indians stand as a type of the whole undermining process by which the Indians of many localities have become physically degenerate.

As a rule, students who are sound on arrival at Hampton do well, and many instances might be cited of individuals who were unsound who improved constantly under treatment, and finished the course satisfactorily.

Immediately on the arrival of a party, after baths and clean clothes have been given, each newcomer passes through a careful medical examination, with special reference to the condition of heart and lungs and evidence of scrofula. According to the condition of the Indian, as determined by the examination, his trade is assigned, and special diet, when necessary, prescribed. A trouble among students from some reservations is

TRACHOMA, OR GRANULAR LIDS.

This disease is measurably contagious, and in a school should receive the closest attention, as it sometimes becomes epidemic. To prevent the spreading of this, as well as more contagious diseases, it is necessary that each child should always use his own basin and towel. This simple arrangement would bar the way to much trouble, and should be as strenuously insisted upon as the use of an individual toothbrush. Good food, especially well cooked vegetable food, good lights, properly placed, good air and strict cleanliness, would prevent nearly every case of granular lids, a disease which, when fully developed, is often very obstinate, and which, without proper treatment, may handicap a boy or girl for a lifetime.

Probably in no way can so much time and pain be saved as in the care of the eyes and teeth of children of school age. From the time of their arrival at Hampton instruction in the hygiene of everyday life is carefully given to all the Indian pupils, to the girls in their homelike "Winona Lodge," and to the boys in their building called "The Wigwam." The formation of the regular habit of regular hours for eating and sleeping is a matter of great importance. I am glad to say that these pupils, though hard to teach, do improve, and many finally become as careful in the details of daily life as a well-bred white boy or girl, and the effect is readily seen in the improved health of the older advanced classes, the members of which are seldom excused for sickness.

During the past six years but three Indians have died at Hampton. These were all cases of tuberculosis. Two of them, one a Kiowa from Indian Territory, one an Apache, were unsound on arrival and died within the first year. Within the same period one boy died from tuberculosis in the Massachusetts general hospital, and one girl from typhoid fever, at the North. Within the past four years there has been but one death, that of the above-mentioned Apache.

The effect of cheerful surroundings and pleasant influences upon the Indian is well known by all who have worked long with him. He is impressionable, in spite of his so-called stolidity.

All school rooms and living rooms should be made bright and attractive. Flowers should be cultivated, and the outside as well as the inside of the house be made an object lesson. Before my mind rises the picture of an exquisitely neat dormitory for girls,

on a remote reservation of Northern Minnesota, converted from a filthy old trade store to this beauty and use by the indefatigable efforts of an energetic government matron. The few feet of front yard were crowded with a glory of climbing nasturtiums, and there was a good influence in the very look of it.

Games should be taught and encouraged in connection with the schools. Basket ball is one of the best new games, both for out of doors and in. Baseball, tennis, and the old Indian games, as far as they are innocent in tendency, should be encouraged both for physical and moral health. The young Indian, at the present time, has few resources within himself, and without help must fall into

DANGEROUS STAGNATION.

A monotonous life is unwholesome to any youth, and to those youth whose introspection can develop little helpful or uplifting it is fatal. There should be a united effort on the part of all who want to help the Indian to relieve him of the monotony of his life, to give him work and play as well, and to make his natural love of excitement a lever for his uplifting.

The nervous sensibility of all Indians is great and leads them to unnatural excitement and corresponding depression. The inevitable inheritance of generations born in tumult, war, fear and uncertainty, must be irritable, nerve centers and moral and intellectual faculties subordinated to the physical. Nature demands a heavy penalty for violated laws. The Indian has ignorantly broken all laws, and has paid, and is paying, a terrible penalty. This does not, however, mean extermination of the race, a portion of which has shown itself capable of adaptation to change of environment and new conditions of social life. Education in living, correct moral standards, and a motive to stimulate endeavor, this is what the Indian needs.

The value of manual and industrial training lies in its unequaled power to supply such a motive and aid in the development of the body and in the formation of character. In Eastern schools, with their full staff of workers, and all agencies for good, including the summer outing in an intelligent family, there is, in addition to regular discipline and instruction, an education by insensible absorption of ideas, and the common sense of everyday life, which is of inestimable value to the Indian pupil. Those who come from Western schools are on a plane where nothing is lost. Western training enhances the value of every opportunity of the East; and

the Indian, on his part, at the East, has wonderfully taught and interested thousands, whose ideas, kindly but vaguely, would otherwise have borne no fruit of helpfulness.

As far as I have known, there is with the majority of Indian pupils advanced to thoughtful years, an earnest desire to help their people. How rapidly they may be fitted for this work, the number and excellence of Indian schools will determine. Many are already equipped, and are doing with their might what their hands find to do. The fact that twenty-three Hampton girls are married to Hampton boys, and as many more to educated boys from other schools, suggests, for the Indian work, a solid foundation of good homes. There must be a great improvement in living where educated Indians join hands to make a home. These young people will surely care for the health of their children, and will put into use for them the practical lessons learned at school.

Here, then, in Christian education is the beginning of the end of the old unwholesome living. The conditions of camp life are sufficient to predispose the strongest to disease, and especially to engender and develop pulmonary consumption. A vicious civilization is responsible for the degradation of camp life. The physical as well as the moral tendency of that life is constantly downwards and without hope. Educating the Indian means offering him a chance to stem the tide of inherited disease which tends to sweep him away. It means salvation from his past and hope for his future. In this work let East and West join hands.

VINEGAR AS AN ANTIDOTE TO CARBOLIC ACID.—Applied to the skin or mucous membrane burnt by carbolic acid, vinegar causes a rapid disappearance of the characteristic whiteness as well as the numbness produced by the acid; it also prevents the formation of a slough. Vinegar also neutralizes carbolic acid introduced into the stomach. In cases where carbolic acid has been swallowed, therefore, Professor Carleton suggests the patient should be made to drink vinegar diluted with an equal quantity of water, and the stomach should then be washed out.—*The Practitioner.*

DRUNKENNESS A VICE—IT SHOULD BE SO TREATED.*

By A. N. Bell, A. M., M. D.

My earliest impression of the result of the dangerous public sentiment with regard to drunkenness (which still obtains) that it is the privilege of the individual who indulges in it—was when I was a lad less than ten years of age. The incident began at a farmer's still, where a half dozen boys had assembled for play. Most of the farmers of consequence in that section of the country (Eastern Shore of Va.), in those days, had small stills and usually made a little brandy every year for domestic use. The stills were frequently run during the early hours of the evening. The light of the fire rendered the place round about an attractive playground for boys, both white and black. One of the latter, about sixteen years old, watching his opportunity when the attendant's back was turned, caught a cup of low wines. He soon became exhilarated by sipping it, and then it occurred to him to have some fun by dosing the little fellows, and he proceeded accordingly. One "little fellow"of my own age and an intimate playmate, was made insensibly drunk, as was also the perpetrator of the "fun." Both were taken to their beds. The little boy was seized with convulsions early the following morning, before having regained consciousness. He was for several days under the care of a physician. The fun maker had sobered up sufficiently by the second day thereafter to be taken to account by his master, a kindly man who but rarely found occasion to punish his servants, but this one had committed an inexcusable offense. He was made to take off his shirt and to receive a lashing with a cowhide. He was known to have been drunk two or three times before, but never afterwards. The "little fellow" temporarily recovered, but epilepsy supervened and continued to the end of his life, at twenty-two years of age, meanwhile becoming an idiot. I have no reason to think that drunkenness is any less common in that section of the country now than it was then, though the stills have long since passed away. They, at least, have not

*Read in abstract at the Meeting of the American Public Health Association, Buffalo, N. Y., September 18, 1896.

proven to be hereditary. Though unquestionably drunkenness has, if there be truth in the faith of some modern hereditists, who believe that drunkenness is a disease transmitted by heredity even to the third and fourth generations; a faith which, if true, would make it difficult to find one among us who is not, in one line or another, at least predisposed to drunkenness. To combat the propagation of this mischievous belief in hereditary drunkenness, a faith which in its practical application rivals the liquor saloon in the encouragement of drunkenness, is the purpose of this paper.

Two other boyhood companions of about my own age are illustrative examples. They were cousins. One was the son of a notorious sot who died soon after the birth of this, his only child. He had a good mother and grew up to be an exemplary man.

The other one was the youngest of five brothers, sons of well-to-do and temperate parents. His four brothers exemplified the excellence of their environment, but not so this one. He soon took to drink and became a drunkard at the age of eighteen years.

After four years' absence and soon after receiving my medical degree, I renewed my acquaintance with those early companions, in the village where I first began to practice. I had learned nothing to increase my respect for drunkenness. And I regarded its tolerance by pity and excuse as being promotive of it. I found my old playmate, the son of a sot who, for short, was called "Kit" by his intimates, to be one of the most charming young men I ever knew, the support of his widowed mother, trusted and loved by all who knew him. The other one was called "Pret." He had well nigh become a scapegrace. He had intervals of soberness, however, and at such times maintained agreeable traits, insomuch that some of his friends were inclined to pity and excuse him, disposed to believe that he could not resist drink. But when drunk he was repulsively disagreeable, even to his kindest friends; he seemed to delight in showing what a hog he could make of himself.

It was not many months after this renewal of our friendship before he gave me such an example of his hoggishness that I repelled it with considerable force. And like a sensible hog, on being kicked off he kept at a distance and did not forget it on getting sober. I soon after conferred with our mutual friend "Kit."

I learned from him that it was "Pret's" habit. That he had on one occasion repelled him in the same manner that I had done, and that he had been so blamed for it that he had since simply tried to

avoid him, but was not always able to do so. However, we came to an understanding. And taking advantage of the sober interval we invited "Pret" to a conference. We recognized no need of rehearsing his baseness, but told him that we had determined jointly or severally, to give him a thrashing if he ever again approached us as he had done heretofore. "If you choose to make a beast of yourself," we said to him, "we give you warning, you must keep away from us."

It soon came to my ears that the "young doctor had shown himself to be a brute in his treatment of poor Pret." But we were not deterred, and we, or rather "Kit," had not long to wait. "Pret" had evidently determined to make an opportunity. It was on a Sunday evening when "Kit" was with his mother, on his way home from church and near his home. "Pret," so staggering as to occupy the whole sidewalk, fell up against "Kit's" mother with such force as to push her down, using foul language to her for getting in his way! This was more than "Kit" could stand. Hurriedly getting his mother through the gate, he turned upon "Pret" with great vigor. He downed him and stamped upon him. He then, with the help of some friends who had witnessed the offence and the beating, took him to his home. His plight was explained to his father and the cause of it.

The next morning I was summoned. Boot heels had left their impression, and both eyes were closed. But there appeared to be no reason to fear any bad results from the beating. For the rest, however, I quickly made up my mind to make the most of my first case of drunkenness—to cure it if I could. I had at the time a case of pneumonia. The lancet was then—fifty-four years ago—about being displaced, in the treatment of that disease, by tartar emetic. The circumstance suggested to me the use of the same remedy in this case of drunkenness. "Pret" soon became a very sick man, and his appearance several times so death-like as to alarm his parents. I managed to keep their confidence, however, and encouraged them to hope for recovery. His mother suggested that he was so weak that she thought he might have a little wine. I assented, but took care to add antimonial wine to it, and he couldn't keep it on his stomach. I was more afraid of letting him get [illegible] soon than keeping him sick too long. I finally let [illegible] and by the end of the third month he was able to be [illegible] later he was well and sober. "Couldn't even [illegible] mor." He so continued to the termination of my

residence there, a year longer. And I was gratified to learn upon inquiry, long after, that he never again took to drink.

A little later I became an assistant surgeon in the Navy, at a time when grog was regularly served to seamen twice daily as part of the ration, and the "cat" was used as a means of discipline; when drunkenness off duty, if not coupled with bad behavior, was excusable. But who, pray, among drunkards themselves, or other observers can vouch for the good behaviour of one who is drunk? Who that does not know that to be drunk is to be beyond self-control; that to get drunk is to place one's self in the condition to debase his race, to commit arson or murder, even when off duty; or, when on, to wreck a train of cars or sink a ship? *The* crime is, primarily, to get drunk. The crimes in consequence of being drunk may be more appalling, but they are less heinous. But I would not get ahead of practical examples.

Among my earliest experiences in witnessing punishment in the naval service was one of a sensitive young man of twenty-two years of age, whose history I had learned through his having been seriously ill sometime before. He was the son of a drunken father, whose bad treatment had driven him to enlist. He confessed to having been on several "larks" before entering the Navy, but didn't think that he had ever been "what you might call drunk." However, from the outset of his service he had never omitted taking his "grog," except when he was on the sick list. On his first day's liberty ashore, after many months confinement to the ship, he quickly became the ringleader of his gang in a mischievous carousal. He was brought aboard "dead" drunk. He required no medical treatment and was placed in confinement. A week subsequently all hands were called to witness punishment. He then asked to see the surgeon. I think I have never witnessed such an expression of unutterable distress in any countenance as I witnessed in his case. There was no evidence of any sickness that he complained of to justify the omission of punishment. Yet he tried to make me believe that he should surely fall dead at my feet if he was not excused; he could not stand it and he knew it would kill him. He was taken from the "brig," stripped and "triced up." The agony of his expression appealed to every one present, but to no one more forcibly than to him who wielded the "cat." He was punished, but not severely, and ordered to duty. But the shock was too great for him. An hour afterwards I was called to him and found him to be in a state of semi-collapse, the pulse weak, but

regular, and the respiration interrupted by frequent sighing. It was relieved by a few doses of aromatic spirit of ammonia and tincture of ginger. But I kept him on the sick list for a few days and made use of the opportunity to remind him that he was not degraded by the punishment that he had received, but by the drunkenness which had brought it about. He vowed never to drink liquor again. He was ever after a restraining force on the behaviour of those with whom he was subsequently granted liberty, and thoroughly trustworthy. He kept his vow.

A few years later I found myself the messmate of two officers, habitually subject to drunkenness when off duty, and liable to it when on. It was not long ere one of them on returning from an afternoon on shore, in a foreign port, had to be assisted on board in sight of the Commander of the ship, and his was the mid-watch of that night. Plainly he would not be able to keep it, and, though drunk, he knew it. He had been drunk many times before. He sent for me to know if I would put him on the sick list. To this I readily assented. This, of course, excused him from watch. I handed my list to the Commander, as usual, the next morning. He looked at it in my presence and found opposite Lieut. Q.'s name—"Gastric Derangement." He asked me if Mr. Q. was much sick, but with a quizical expression, which seemed to question my reliability. I replied that he was indeed *very* sick, and likely to be on the list for several days, and perhaps for weeks. Yet he looked incredulous; he had known Mr. Q. for several years, as he had also known others addicted to the same kind of illness, generally of only a few days duration at most. I explained to him that I had been up most of the night with Mr. Q., that his stomach was terribly upset, vomiting and retching most of the time, despite mustard and other external appliances. And such was really the case. I had begun treatment similar to that already described in "Pret's" case. I pursued it for three weeks, by the end of which time Mr. Q. was quite weak and a good deal emaciated. He slowly but steadily convalesced. He persuaded himself that the climate was bad for him—it was on the coast of Africa—and tried to persuade me to second him in making application to go home. On this, however, I took decided issue with him. Reminded him that the cause of his illness would be no less dangerous to him in any other climate than was that of the African coast; that in short, a few more drunks such as that through which he had but just passed would be fatal to him in any climate. He was restored to

duty and abstained from liquor for about six months, when he suffered a dinner party to initiate another spree. He was again incapacitated for duty, and subjected to a similar course of treatment. He recovered, as before, but with the determination never to drink any more intoxicating liquor. I suggested to him that it would be well for him to strengthen his promise by writing to his wife his renewed determination. (He had been intemperate before marriage, and married under the promise that he would quit drink, but soon after broke his promise and rendered his wife miserable.) He did so, and in verification of his earnestness he showed me the paragraph of his letter. He was ever after a changed man. He was effectually cured. We terminated the cruise together. I saw him frequently during subsequent years, until within a year of the time of his death, in action in the second year of the war. The other messmate afforded me a like opportunity for treatment, but with a fondness for liquor and a wilful determination to drink it at all hazards that was shocking. I cite his case only to show the subordination of his will to his passion for drink. He was a young man of unusual brilliancy, possessed the most remarkable memory of any one I ever knew; could literally rehearse matter on many subjects that he had read but once years before. But he was a wicked man, with no religious instincts and eschewed moral restraint. My last appeal to him was made while he sat up in bed, recovering from a recent debauch. I said to him, "S——, you remind me of an incident of which I have read, that is said to have occurred in the life of the famous Archdeacon Paley," which I related. He entered Christ's College, Cambridge, when he was but sixteen years old, and at once took rank as a brilliant student, while during the first two years of his course he lead a most dissolute and dissipated life. He would spend half the night in carousal, frequently rendering himself subject to punishment and threatened expulsion, and yet he was found at the head of all his classes at recitation. It was at the height of his excellence in dissipated habits that one morning a fellow student sought his assistance for the solution of some difficult problem and knocked at his door. "Come in!" he responded. He was sitting up in bed, with a pipe in his mouth, a glass of liquor in one hand and a bawdy book in the other. His visitor looked on for a moment in amazement until Paley said: "Well, what are you staring at; what do you want?" "I am staring in amazement at you. I have called to ask your assistance, and I am shocked at your appearance—dissipating capabilities which if conserved and

utilized as they should be would ere long make you one of the first men in the kingdom."

"You think so, do you," replied Paley, and he let fly the book at his caller; then the glass with its contents, and next the pipe. "Now," said he, "let's see what you want." He rendered the needful assistance. Paley was ever afterwards a diligent student and became a philosopher of continued fame. S—— heard me patiently and said: "Well, suppose I were to stop drinking now, which I could do if I were of mind to, how long do you suppose I would live?" (He already had hypertrophy of the heart and was short winded.) I replied: "You well know that you are already a good deal damaged, but by such care of yourself as you ought to take you would probably live ten years and maybe more." "And how long if I don't stop and go on drinking just as you have seen me, and as I have been doing for the last five years?" "Not two years, and perhaps not one-fourth of that time." With a shocking oath he replied: "I'll drink and take my chances." He died in less than two years.

Passing an interval of twelve years, now settled in Brooklyn, I was hurriedly sent for one morning to visit a gentleman whose family I had occasionally attended at one of our most fashionable hotels. I found him in a wild state of delirium tremens and his wife and three daughters terribly frightened by several attempts he had made to get out at the window. With the assistance of a servant he was at once induced to get into my carriage, and I took him to the Brooklyn Hospital, of which I was one of the staff, and at the time on duty. After a week's treatment in the delirium ward, he recovered his reason and became sensible of his surroundings. He was overwhelmed with mortification and grief to find himself there, and with much difficulty consoled, after allowing him to examine the hospital register himself, in verification of my assurance that his name was not recorded or known to anyone connected with the institution but myself—another name having been substituted for the occasion. His wife was sent for, and on my advice he was kept in the same ward, with iron-barred windows for two months, his wife being with him and his chief nurse. He begged hard for liquor during the first two weeks after recovering from delirium, but by the end of that time he began to understand the earnestness of the assurance of his wife and myself, that it had been definitely stopped; that he was *never* to drink liquor again. He became more and more reconciled to this determination, and before the end of

the second month promised us he would never drink again. He was a man of forty-four years, a tea merchant by occupation; one of four sons and two daughters of temperate but not abstemious parents. He had been a free liver and subject to occasional sprees for a dozen years, but this was his first attack of delirium tremens. All the other members of the family were temperate. About four months subsequent to his discharge from the hospital, on New Year's day, he called at my house and left his card. On the reverse of the card was the picture of a hat with a brick in it holding it down. He died a few years ago, at nearly seventy years of age, twenty years subsequent to his having been thoroughly cured by two months confinement and appropriate treatment in the delirium ward of a hospital.

It would be easy for me to multiply examples from my memory of a multitude of cases, but my purpose has been to cite only such and so many as serve to show the common aspects and dangers of drunkenness and its curability by timely and appropriate treatment.

But I am not unmindful of its liability to become incurable by wilful persistence until the will is overcome and the individual loses his power of restraint, becomes an imbecile, epileptic, idiot, or insane. These are consequences with which all observers are familiar. Moreover, that the descendants of drunkards are commonly defective, in one way or another, but no oftener drunkards than defective in other respects—weak-minded, imbecile, idiotic, insane, paupers, tramps, thieves, house burners and murderers; that they are in short the recruiting host of almshouses, asylums, jails and penetentiaries all over the world, is common knowledge. These conditions immensely add to the force of my argument.

But I would not have it supposed for a moment that I am ignorant of the special pleading of the advocates of hereditary drunkenness, or that drunkenness—called by another name or otherwise —is a disease. The periodical literature of the day, reflecting the treatises of inebriate asylum keepers, is so overloaded with such pleading and wasted sympathy that he who runs may read. And as little do I intend to submit my observations, unsupported, in rebuttal of such fallacies.

In the report of the Surgeon-General of the U. S. Army, for the year ending June 30, 1895, Captain and Surgeon W. H. Arthur reports having reduced the statistics of alcoholism at Vancouver

Barracks by dealing with drunkenness as with acute poisoning, as follows:

"The report of the Surgeon-General for the year ended June 30th, 1892, mentions this post as having out of all the Army the highest rate of admission to sick report for alcoholism. The number of cases of simple acute alcoholism that appeared at sick call and during the day, when I first assumed charge of this hospital, was unusually large, and resulted in the laying down of certain rules in an effort to discourage drunkenness as far as it was in my power. No man is taken on the sick report or excused from any duty unless, in my opinion, his condition would make it actually dangerous for him to keep at work. I may say here that such cases are in my experience very rare, and that a mistaken pity for a man suffering from the effects of a debauch is liable very often to lead a too indulgent post-surgeon to excuse him from duty when the guardhouse, and not the hospital, is the proper place for him. I am confident that this mistaken kindness has done a great deal in the past to encourage drunkenness. Each man who has reported at the hospital in any stage of simple alcoholism is treated as a case of alcoholic poisoning, taken immediately to the operating room, his stomach emptied by the use of the stomach pump, and thoroughly washed out with warm 2 per cent. soda solution. After this he is given a bowl of hot beef extract, with cayenne pepper, allowed an hour's rest, after which he is generally perfectly able, however unwilling, to do his duty. If the weather is severe, either very hot or very cold, it might not be safe in his depressed condition to force a man to work out-of-doors immediately after this procedure, but at this post the extremes are not great, and it has in no case resulted prejudicially to the patient. Occasionally some resistance is met with, but two, or at most three, able-bodied hospital-corps men and a perforated wooden gag, such as comes with the stomach pump, will, with patience and determination, overcome almost any ordinary opposition. I have found for this purpose the gum elastic stomach tube in the old-fashioned stomach-pump case, connected with Allen's surgical pump, work very satisfactorily. The ordinary soft rubber lavage tube is too easily collapsed, and is more difficult to introduce when there is resistance.

"The effect of this treatment has been uniformly excellent. The stomach, emptied of its irritating contents and cleansed of the thick, tenacious mucus that is always present in such cases, is much less irritable and rarely rejects the beef extract which is given immediately; the nervous symptoms improve at once, and sedatives administered by the mouth have a far more prompt and lasting effect, and in almost all cases the craving for liquor is very much diminished. Of course cases may occur which are too serious for such summary treatment. I have not met with any myself, and have used the stomach pump with good effect in cases even of delirium tremens and alcoholic coma. These cases, of course,

are promptly taken into the hospital, and treated as dangerously sick men. The deterrent effect of this treatment is excellent. It is, of course, not agreeable, though no one can deny that it is perfectly rational and merciful. In the past ten months but one man has been admitted to hospital for alcoholism. There are, no doubt, other factors that enter into the production of this marked change in the post in two years, but I am confident that this method of treating alcoholism as poisoning has been a very important, if not the principal one. I may add that in but one case has it been necesssary to use this treatment on the same man more than once."

Dr. A. Motet, Medical Expert of the Tribunal and the Court of Paris, in a paper on Intoxication and Crime, read at the Fourth International Prison Congress, St. Petersburg, in 1890,* says:

"Simple intoxication is that which prostrates a man, otherwise healthy, after excess. We do not wish to enlarge on the varieties of simple drunkenness, although the nature of this poisonous agent plays a great role in the evolution of possible accidents. We hold to this precise determination that temporary drunkenness may be avoided by individuals. Hence the act is voluntary and the consequences are chargeable to intoxication whether or not the drunkenness is habitual. * * * 'Drunkenness is a voluntary and reprehensible fact, and it can never constitute an excuse which morality or law will accept.' Mark and Tardieu are of this opinion. It is also ours. Simple intoxication is punishable because it can, if unpunished, begin to-morrow the same excesses of which the consequences will be to compromise again the interests of society and individuals. * * *

"Pathological intoxication differs from the preceding in that the pre-existing morbid condition added to the usual symptoms, acutely aggravated by alcohol, assumes a character immediately dangerous. According to the expression of Lentz, 'alcohol lights the fire whose ravages will be more extended in proportion as the materials upon which it feeds are more combustible.'

"And there exists besides insane, properly called, imbecils and epileptics with whom drunkenness is especially deplorable, a numerous class of degenerate persons, bearing heavily the burden of pathological heredity, capricious in their ideas and in their acts. These are the true maladies in which the intoxicating action of alcohol manifests itiself more frequently by dangerous impulses. These are the unbalanced, the hereditary drunkards who cause the most serious embarrassment.* * *

"The considerations which we submit to the Congress have aimed, above all, to separate simple from pathological intoxication. However, we believe we are authorized to present the following conclusions:

1. In the interest of social order, of family protection, of individual preservation, voluntary intoxication should be considered

*C. D. Randall's Report, Circular of Bureau of Education, No. 2, 1891.

as a misdemeanor and severely repressed with increase of punishment in the case of relapse.

2. The habitual drunkard should be deprived of his civil rights and his removal from office should be secured by the public minister. And as a corollary we add that persons affected with delirious attacks, active or subactive, from alcoholic intoxication, should be maintained in a special establishment during a long time. Their discharge should be postponed until every trace of intoxication has disappeared, and an early relapse will not be feared.

"To give our thought a more definite form we will say:

"Drunkenness is punishable, as well as misdemeanors or crimes committed under its influence, when it is classed as simple and when it is manifestly in the power of the delinquent to avoid it.

"It is punishable with increase of punishment when the intoxication has been sought to incite the commission of a crime or misdemeanor.

"Drunkenness is punishable, but with a degree of mitigation which belongs to the magistrate to determine, in the case of persons with feeble intelligence whose ability to resist alcoholic desires is diminished by the inferior condition of their mental organization. They should not be exculpated when they know that they cannot drink without danger, and this is the case more frequently than is supposed.

"Crimes or misdemeanors cannot be when they are committed during delirium, acute or subacute, from a paroxysm of alcoholism. It is the same in a case of chronic alcoholism, when the definite cerebral injuries have compromised the integrity of the organ and determined the durable disorder of its functions."

Opposed to such observations and practical results in the rational treatment of alcoholism, and to the application of such practical measures as have been evinced by independent scientific investigators with special reference to human welfare and the well-being of society, are the inebriate specialists and their puerile satellites, the "scientific temperance" bookmakers, who are bent on holding up the present generation of drunkards as pitiful objects of a hereditary "disease" for which they are not responsible—a "disease" bred in the appetites, livers and bones of their *male* ancestors; for, be it remembered, the statistics which such "authorities" adduce are almost wholly confined to the male ancestry. By which it appears daughters are not subject to hereditary drunkenness, as they are not to the saloons and other environments where drunkards are commonly made. But I do not mention saloons even as any excuse for drunkards. Saloons would not exist but for the patronage of wilful tipplers and drunkards who support them. I would not put the boot on the wrong leg.

As illustrating the relation of saloons to drunkenness, it appears that since the famous Raines Liquor Law went into effect, in the city of New York—reducing the number of saloons and prohibiting those which remain from opening on Sunday—drunkenness has greatly increased. The statistics of Bellevue Hospital, which is the only institution in the city where drunken persons are received as patients, show that from July 1st, when the law went into effect, to August 20th, 649 cases of alcoholism were treated, in the men's division alone; against 400 cases for the corresponding period of the year 1895—a gross increase of five cases daily. Plainly showing that drunkards do not depend upon the saloons, though they are ever ready to resort to them.

Nevertheless, the apologists for drunkards are ever ready with excuses and expressions of profound sympathy for them. "Poor fellows, they cannot help it"—cannot even help going into a saloon—they say. And they discourse learnedly on inebriety as a disease, but always requiring their own skilful treatment in a "home" equipped for profit.

Surely nothing can be more pleasing or encouraging to drunkards than to have the public mind thus abused, and their relatives imposed upon for means to support them in idleness and luxury during a period of remorse. The "cures" in such institutions, like the Keely "cures," are frequent in the same individual. But at the last it commonly happens the "disease" has become so deeply seated that the individual, if his relatives can afford it, has to be provided with permanent quarters in the "home;" to be kept out of sight of his relatives as much as possible, but still pitied and petted as an unfortunate "invalid."

It would be easy to draw the parallel of a drunkard with the thief in their respective tipplings, deeper crimes and final "homes," the one in the inebriate asylum and the other—where both ought to be—in the penitentiary. These may be harsh words to some persons—persons whose affections have been torn by drunken relatives. But they are the expression of a conviction founded upon extensive observation and deep study.

But I would not be understood as wholly denying that drunkenness may be hereditary. The physical structure of the human body under the persistent use of alcohol is indeed liable to become diseased in a variety of ways. The progeny of such diseased persons, as already shown, are more likely to become intemperate, as they are to become epileptics or insane, than the children of healthy parents. But to reason from such premises that intemperance,

from the beginning, is a disease and not a vice, is to accept the weak-minded progeny of drunkards as the type of manhood, and to assume an incapacity for conscious purpose as the measure of the human will. Such indeed appears to be the standard by which the inebriate specialists measure man's capacity for self control.

But, measured by common observation, extensive study and the records of institutions for the care of defectives and criminals, everywhere, clearly of all vices which afflict human society by both tolerance and perpetration, drunkenness is the most common and the most debasing. To arrest it, it should be made proportionately odious and punishable.

GRAVEYARD DANGERS.

While all are agreed as to the danger, or at least the inexpediency, of intramural interment, of burial in vaults, and in the "dead" earth of city churchyards, the apologists of earth burial insist on the destruction of pathogenic by saprophytic microbes and the energy of the nitrifying process in suitable soils, and the advocates of cremation believe in the greater vitality of some disease germs and the real risk of the pollution of the ground water and wells, though this danger is minimized by the general substitution of public water supplies for private wells in all towns or large villages. Even Hoffmann, the official defender in Germany of the existing practice, admits the persistence and diffusion of the bacteria of typhoid and cholera, and recently Prof. Albu, in a prize essay on cremation, has collected a large mass of well authenticated instances of this. It is true that Skrzeczka, Wernicke and Pistor have endeavored to account for the great mortality from typhoid fever and cholera pointed out by Zuelzer among the population residing in the immediate vicinity of the Berlin cemeteries on such hypotheses as lowness of site, movements of ground water, density of population, which Albu deems insufficient; but the pollution of the ground water and wells in Vienna from 1875 until the provision of a pure public supply from distant highlands, by percolation from the cemeteries which encircle the city on rising ground became more and more pronounced, the water at length being turbid and yellow, charged with nitrites, and positively offensive from hydrogen and ammonium sulphides. Dr. Levison, in a report published in 1886 on the graveyards of Denmark, stated that

Copenhagen and twenty of the sixty-eight towns in the kingdom had suffered from this cause, and that seventy-eight epidemics of typhoid were distinctly traceable to the proximity of the graveyards. Dr. Lamm says that around the three cemeteries near St. Petersburg the annual mortality had for some years been from 75 to 85 per 1,000, while that of other and even poorer quarters of the city was only 25. To Dr. Doenitz, who for many years held a professorship of medicine at Tokio, we are indebted for one of the most striking instances of the persistence of infection in the earth. During the epidemic of 1877 a detachment of troops sent to quell a disturbance in a remote district had suffered very heavily from cholera, but from that year until 1879 the disease was entirely absent from the whole empire. The authorities then determined on removing the bodies of the soldiers to a public cemetery, employing a number of laborers for the purpose. While so engaged cholera suddenly broke out among them in the absence of any other possible means of infection, and the same occurred at another place under similar circumstances, these two localities forming the centers of the origin of the epidemic of that year. The outbreak of cholera at Jativa, in 1890, when Spain and Europe generally had been free for five years, though not connected with cadaveric infection, having been ascribed to the excavation of soil saturated with the evacuations of sufferers in the preceding epidemic, is analogous; while Sir Joseph Lister's case of the hospital haunted with gangrene which baffled all efforts at its suppression until the bodies in an adjacent churchyard had been exhumed and burnt, and Mr. Wheelhouse's, of the Yorkshire village, where scarlatina of the most virulent type reappeared after the lapse of thirty years, while the remains of the victims of the fever in the preceding generation were being exhumed for the purpose of adding part of the closed churchyard to the parsonage garden, with like instances of the resuscitation of yellow fever and the plague, suffice to prove if there have been some exaggeration, there is nothing incredible or even improbable in the most ghastly stories of the plague in mediæval times, and, indeed, until the close of the seventeenth century. —*Brit. Med. Journal.*

A BRISK BUSINESS.—"Yes," said the man who is always depressed, "business is very slow."

"I've heard some people say they were prospering."

"Well, maybe they are. The only fellow that I've heard of who could bring around his bill and collect anything on it lived in New Jersey. He was a mosquito."—*Indianapolis Journal.*

RESOURCES OF CLIMATE IN HEALTH AND DISEASE.*

By S. S. WALLIAN, M. D.

In studying the physiological and pathological characteristics and influences of the different climates on the human economy, the first observed results on experiencing a *hot climate* may be thus approximately outlined:

1. The circulatory and respiratory systems are immediately but not permanently stimulated, the breathing and cardiac movements being accelerated.

2. The body temperature is definitely increased, the elevation amounting to as much as 1° Fahrenheit, and persisting for years, if not permanently.

3. The appetite is correspondingly increased.

4. The kidneys and sexual system are involved in the prevailing condition of excitation. Puberty in both sexes is inclined to precocity, the animal nature maturing at an early age in comparison with its development in colder climates.

5. There is a marked tendency to enlargement of the liver.

6. The individual loses weight and tends to become spare, notwithstanding the increase of appetite.

Nature's two prime tonics, antiseptics, germicides and restoratives are *pure air* and *sunshine*. In comparison, all the products of the laboratory and the lists of the pharmacopaeia are rubbish and dross. It follows that the value of any climate to the hale man, or to the invalid, is in exact proportion to the opportunity and inducement it extends to him to avail himself of these potent agencies. Besides this crucial test the readings and indications of all the complicated meteorological instruments are scientific shoddy. Climatologists need a *comfortometer*.

Climate is unquestionably a controlling factor in establishing the death-rate of any community; but the mortuary statistics are proverbially unreliable, since the records are so carelessly kept and so indiscriminately compiled. Official and compulsory records, extending over long periods, will be required to make these tables accurate, or even passably reliable guides. From those at hand, some approximate inferences may, however, be deduced.

* The *American Therapist*, May, 1896.

The average annual death rate of the several European countries is thus stated:

France, one in thirty-two: Prussia, one in thirty-nine; Austria, one in forty; Norway and Sweden, one in forty-three; Denmark, one in forty-five; England one in forty-six.

The average annual death-rate for the United States, based on less reliable data than the foregoing, however, has been stated as follows:

Gulf States, one in sixty-three; other Southern States, one in seventy; Mississippi Valley and Atlantic States; one in eighty; Western States, one in eighty-one; Pacific States, one in one hundred and fifteen, and Northwestern States, one in one hundred and twenty.

Setting aside a wide margin on the score of incomplete and inaccurate data, and in the face of the fact that various European localities have acquired a world wide reputation for healthfulness, it appears evident that the climatic conditions found in favored portions of our own country, as well as throughout the entire Union are more conducive to health, enjoyment and longevity than any found in Europe.

THE BEASTLY CLIMATE.—He threw himself on the lounge and exclaimed, mournfully, "I guess we'd better sell out and move."

"I don't think so," was his wife's emphatic reply. "We have made our home here, and our friends are here, and I'm sure there isn't a prettier city anywhere."

"I don't like the climate."

"Everybody else seems to think it's as good a climate, take it the year round, as is to be found in the whole country."

"It doesn't agree with me. My health's bad."

"It wasn't bad this morning. You said you never were better."

"That's the worst part of it. It's one of those mysterious things. I can't just say what's the matter with me, and yet I know that I feel terribly bad. It's that gloomy uncertainty of it that makes it dreadful." And he gave a suppressed groan.

"You don't pay enough attention to your diet," she said, with the quiet emphasis which betrays a thorough knowledge of one's subject.

"That simply shows how a woman will jump at a conclusion. I didn't eat any luncheon until two o'clock, and then I discovered

that I felt a little played out. I knew that if I didn't eat anything you'd say that was what made me feel badly. So I put my coat right on and got a bite or two, just to keep you from complaining."

"What did you eat?" his wife inquired, suspiciously.

"I ate a caviar sandwich and drank a glass of buttermilk."

"Nothing else?"

"Yes. I didn't feel just right then, so I got a piece of lemon custard pie. That didn't do much good, so I bought some pears at the fruit stand and ate them, but they didn't help. If anything, I felt worse than ever. I thought maybe I was overheated, so I went back to the lunch room and got a dish of ice cream and some angel cake, and just before I started home I drank a glass of root beer, but it was no use. I don't feel right yet, and I've made up my mind that if I want to keep my health the only thing more for me to do is to move out and go to some place where the climate agrees with me."

His wife looked at him, but did not try to argue. She merely called the hired girl and sent her on an errand to the drug store.—*Detroit Free Press.*

ARTIFICIAL TEETH.—Vice-Commercial Agent Murphy, of Luxemburg, under date of July 26, transmits the following translation of an article from L'Independance Luxembourgeoise, of July 23, 1894:

"It is in America that the worst teeth are found, which accounts for the multitude of dentists, more or less American, scattered over the globe, and especially for the importance of the American fabrications of everything pertaining to the art of the dentist. If it is possible to believe authentic documents, the cost of an artificial tooth at the factory in the United States should not exceed 30 or 35 cents. One of these factories in New York sells not less than 8,000,000 of these teeth per annum. The teeth are of porcelain, covered with a special enamel, the application of which is so delicate that there are not two teeth which are tinted exactly alike. Moreover, there are about fifty different tints, which are artificially obtained, corresponding with the color variations of natural teeth. The imitation is carried so far in simulating defects as to render the illusion more complete. If these dispatches are credible, the factory stocks ought to be quickly exhausted."

MEDICAL EXCERPT.

By T. P. Corbelly, A. M., M. D.

Protonuclein.—Our colleague, Dr. H. K. Bell, reports the following case: Mrs. E. F., 38 years of age, had been bed-ridden for eight years with ankylosis, to whom I was called during June last to treat an abscess of the labia majora. I immediately ordered the use of protonuclein in tablets, one three times a day. The abscess healed quickly, but was followed by a second one in the lumbar region, but it, too, quickly yielded to a continuation of the same treatment. A third occurred in the axilla; this and two felons that occurred were disposed of by a continuation of the treatment. During her sickness she had prickly heat over the whole surface of her body, which was especially distressing over her bed-sores, which were extensive. But the bed-sores healed kindly notwithstanding, and the prickly heat disappeared without other treatment, and I gave protonuclein the credit of curing the prickly heat as well as for the rapid healing of the abscesses.

Salicylate of Methyl in Rheumatism.—MM. Lannois and Linossier of Lyons were the first to propose the application of the salicylate of methyl externally, with a view to its absorption (La France Medicale, 4th Sept.), and they have pointed out its value in the treatment of articular rheumatism. In their first communication, they considered the subject only from a theoretical point of view, and considered only its facility of absorption by the skin like other medicinal agents that have the property of giving off vapor at low temperatures. Clinically, the salicylate of methyl has been employed by them in a variety of cases of rheumatism, as in acute, subacute, deforming, blennarrhagic and in many other cases in which peripheral pain was present, as in neuralgias, the neuritis of the tuberculous, etc.

In all these cases the methyl salicylate has a most distinct action on the pain, which it relieves in a time varying in length, and the relief lasting for a period more or less prolonged according to the case, and the cure follows in a few days.

Methyl salicylate should be employed in cases in which, for any cause whatever, it may be desirable to obtain a local action, and when the usual remedies for rheumatism are not well borne by the stomach. It acts well in acute articular rheumatism, but it ought not to be employed in these cases unless the internal use of reme-

dies has failed, because it is rather difficult to apply it on very painful joints. But, in the subacute and chronic forms, in the severe shooting pain which is felt from time to time in the different varieties of rheumatism, in which deformity is a consequence, the local absorption of methyl salicylate acts quite as well as the absorption of the salicylates, and is frequently far superior to them.

ANGINA PECTORIS IN BRIGHT'S.—M. Rondot (La France Medicale) says that in cases of subacute or chronic nephritis, severe attacks of *angor pectoris* accompanied with scanty urine may be frequently observed. The condition *angor pectoris* often acts as an element, superinduced, and a rythmic palpitation, independent of all appreciable cardiovascular changes, may exist. These attacks improve and finally disappear under the influence of the remedies used for the insufficient quantity of urine.

PYORRHOEA ALVEOLARIS, or as it is commonly called, "Riggs' disease," is an inflammation of the peridental membrane, causing this delicate structure to suppurate and waste away. The teeth affected become loose and fall out of the mouth, or they are easily extracted. The disease may confine itself to one, two, or three teeth; very often, however, the entire row becomes involved. A case of this disease fell under my observation about two years ago, that had so far advanced, despite the treatment of a careful dentist, that he advised the sacrifice of the teeth and the substitution of an artificial set without longer delay, lest it should result in periostitis and caries of the bones. I advised the leaving off of all other remedies and the exclusive use of *Listerine* as a mouth wash. The result has been complete recovery, not a vestige of it remains, nor has a tooth been lost. A. N. BELL, M. D.

AUSCULTATION IN PLEURISY. — M. Hewauet (La France Medicale, 28th August): It is generally asserted that the pleuritic souffle and the egaphony are caused solely and simply by the presence of the effusion in the pleural cavity. This is accounted for by the changes in the consistence of the compressed pulmonary tissue. If this were true the souffle would be always present in pleurisy. But this is not the case. Many cases are completely developed without the presence of this stethescopic phenomenon, whatever may be the quantity of liquid effused, and besides, the presence of liquid in crowding the lung does not really modify its consistence. It is necessary, then to admit that, when the souffle exists it is caused by a pulmonary change entirely independent, as tuberculosis, pneumonia, one of the different kinds of broncho-pneumonia.

Thus causing the tubular souffle, which assumes a certain pitch, because it is transmitted to the ear through a quantity of liquid. The same reasoning applies to the egophony, which is as inconstant as the souffle.

Conclusion: The pleuritic souffle and the egophony do not indicate the condition of the pleura, but that of the lung.

PROGNOSIS OF ALBUMINURIA.—M. E. Cassaet of Bourdeaux makes the following statement to the Troisieme Congres Francais de Medicine.—Progres Medical 29th August.—Before studying the relative value of the principal diagnostic signs of albuminuria, it is necessary to remember that, if the kidney is a filtre it is so by a special action, that is, it eliminates certain substances with a greater rapidity than could be expected from the degree of their solution in the blood. Everybody knows that in the specific elimination of urea in regard to water, the urea is found in the urine in a proportion 52 times greater than in the blood.

These facts being established the proposition of M. Arnozan which is as seductive as it is original, namely, that a previous inflammation of the epithelium is necessary to cause albuminuria is too general. Experiment has proved however that the injection of the albumen of the egg into the veins is soon followed by albuminuria of the same kind. These results are applicable to human pathology. It has been proved, indeed, that the several forms of albuminoids differ only in their molecular groupings, so that it is difficult to isolate some of them that are found occasionally in the blood, as foreign substances, and in regard to which there is no certainty that they are not eliminated from the system by simple filteration.

Is the quantity of the urine thus affected always a certain factor in the prognosis, as Mr. Talamon claims? The fact has not been definitely proved, at least in regard to the influence of the albuminuria. A preliminary question ought to be explained: If the kidney is in certain conditions a simple filtre for the albumen, is it not the natural filtre for it when it is a foreign body in the normal serum, or is it eliminated in certain determined proportions in the serum? Until this factor in the enquiry is positively determined, we cannot determine certainly, if in a given quantity of water a greater or less quantity of albumen is of importance. The proposition might be reversed.

The question of congenitality is certain and the fact that a rhenal lesion has caused death among ancestors should not be neglected, for in five cases the foetus of mothers who had puerpal eclamp-

sia, died soon after their birth, and in every case I have found lesions exactly indentical with those of the mother. In each of these five cases the liver was attacked just as was the kidney.

M. CARRIEN.—The question regarding the value of purgatives in albuminuria has been frequently discussed. In one case I observed a free and profuse discharge of albumen following the administration of a purgative. In a second case the purgative caused nearly a complete disappearance of the albumen. I have never observed any inconvenience to follow the administration of a purgative.

M. LINOSSIER.—In regard to the "chemical prognasis of albuminuria," the separation of the albumen of the urine into distinct species is absolutely impossible; but the rapidity of the formation of the precipitate, in the method of Heller-Gubler, and the more or less perfect limitation of the ring, have some importance. Delay in the formation of the ring, its greater diffusion, its lesser opacity, its formation in the upper part of the test-tube, are favorable prognostic signs.

THROMBOSIS OF THE CORONARY VEINS OF THE HEART.—M. G. Etienne, in La France Medicale, 21st August, reported the case of a young man, 18 years of age, who was attacked with typhoid fever of moderate intensity; the development of the disease was normal, and at the end of the 51st day he fell into a condition of collapse, and died three days later. At the autopsy M. Etienne found a thrombus in the large coronary vein of the heart; it consisted of a hard cord, jutting out from the side of the cardiac muscle. The histological examination left no room to doubt the nature of the lesion.

THROMBUS OF THE INFERIOR VENA CAVA. — MM. Haushalter and G. Etienne reported three cases of thrombus of the inferior vena cava which were not apparent during life, except by very feeble and uncertain signs in those suffering from the tuberculosis.

BATTLE & CO'S PREPARATIONS. — P. N. de Duboeay, M. D., F.R.C.S. of Tallulah Falls, Rabun county, Ga., Sept. 22d, 1896, writes:

"I have used Papine, Bromidia and Iodia extensively in my practice, and expect to continue doing so, as these preparations undoubtedly are of great value. I have found your Iodia specially useful in cases of Menstrual disorder generally, and as an alterative. Papine must of necessity come greatly into vogue with the general practitioner, relieving pain as it does without the unpleasant after effects. It was of great value to me in treating the pain in a female suffering with (incurable) Cancer."

EDITOR'S TABLE.

SANITARIAN, OCTOBER NUMBER, 1896.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

BROOKLYN'S BAD WATER.

Our readers will doubtless be as much surprised to learn of the disgusting odor and bad taste of Brooklyn's drinking water, recently, as the Commissioner of Health and the Commissioner of City Works have been, by the sudden exposure of their neglect. The SANITARIAN has constantly maintained the superiority of Brooklyn's watershed—if it may be so called—which we recently described as the Long Island Water Basin,* in relation with numerous ponds. These Long Island ponds are almost wholly sustained by *filtered* water through the sand, in the midst of which they are sunken. They have no outlets except by seepage into the sandy soil, by which they are bound and over which they rarely flow. Some of them have been converted into reservoirs, and others utilized to supply reservoirs otherwise situated. All of them are catch-basins, more or less, of the leaves and grass round about, wafted by the winds. Some of them have luxuriant vegetable growth extending quite down into the water on their margins; and there are others into which flow filth-laden streams from neighboring villages. Moreover, there are many "driven wells" into the sand, which contribute to the water supply, and a large proportion of these are driven to the depth of about twenty-four feet, only to the first subsoil water holding surface filth in solution.

The accumulation of putrescible matter from these various sources of impurity appears to have had but little notice taken of it by the engineers in charge, and not even to have been thought of by the Commissioner of City Works. It is reasonable to suppose that the reservoirs and ponds and their tributaries have been cleansed sometimes, but the recent discussion of the subject has failed to elicit any evidence that the keeping of them clean has been an object of special attention by the Department of City Works, or that a constant surveilance of the drinking water is a recognized duty of the Department of Health.

* Sanitarian, Vol. XXXIV., p. 222.

"A gate-keeper employed at one of the ponds included in Brooklyn's water system, was asked how long since the pond, of which he was in charge, had been cleaned. He answered: 'Eleven years.'"

From other statements that have been elicited, this one is not singular nor exaggerated with reference to the dozen or more reservoirs and ponds which contribute to the supply.

The explosion was evidently the result of the decomposition of the accumulated mass of putrescible matter in the reservoirs and ponds suddenly invigorated by the prevailing high temperature. The engineer in charge appears to have been so surprised by the result that he doubted his senses of taste and smell of the water because he could not see the nauseous and stinking gas that it held in solution, so he declared it wholesome. The Commissioner of City Works was so taken aback that he forgot for the time, or else he had never learned that there was an elaborate laboratory in the Department of Health, by which he should have been constantly advised of the quality of the water. In default of such knowledge, he straightway retained a distinguished chemist to analyze the water, and asked for an appropriation to establish a chemical laboratory in the Department of City Works And the Department of Health appears to have been in such a state of unreadiness to supply the needful information—on other qualities of the water besides its bad odor and taste—that the Commissioner declared an appropriation of $5,000 was necessary, with which to make chemical, bacteriological and biological examinations, as there were no funds for the purpose, though both the chemical and bacteriological bureaus, personally at least, by the roster of the Department, and, to all appearance, their respective bureaus were well equipped with apparatus. The sum of three thousand dollars was promptly granted him. September 9th, the Commissioner reported, in substance, that the bad conditions were due to an unusual amount of decaying vegetable matter in the water of certain ponds and streams from which the water was in part received; that it was not unhealthful, but that there was great danger of its becoming so. He submitted to the Mayor a number of reports from his subordinates, including the Chief Chemist, the Chief of the Bureau of Bacteriology and of the Sanitary Engineer, verifying the uncleanness of the reservoirs and their tributaries. The Chief Chemist reported on sample taken from laboratory tap, at Department of Health September 2d, results expressed in parts by weight in 100.000 as follows:

Chlorine in chloride	1.20
Sodium chloride	1.977
Nitrates and nitrites	0.1640
Free ammonia	0.0008
Albuminoid ammonia	0.150
Hardness B. B.	2.65
Hardness A. B.	2.65
Loss on ignition	3.00
Mineral	5.50
Total solids	8.50

Temperature F 68°.

September 5th:

Chlorine in chloride equivalent to	1.20
Sodium chloride	1.977
N. in nitrites and nitrates	0.0489
Free ammonia	0.0006
Albuminoid ammonia	0.0150
Hardness B. B.	2.35
Hardness A. B.	2.25
Loss on ignition	3.30
Mineral	5.20
Total solids	8.50

The Bacteriologist reported a multitude of interesting vegetable growths in the water, many of which were in great abundance:— "The diatoma gave the vegetable odor. The cyanophyceae, the grassy odor; the fungi, the offensive odor of decomposition, and the infusoria, the fishy odor. The organisms that were most common were the bacillus fluorescens liquifaciens, the bacillus arborescens, and the bacillus mycoides. There were others, but not in such numbers. Occasionally the doctor found an asterionella and a tubullaria. The volvox globator was found in great quantities in a sample of water taken from Ridgwood reservoir."

On the physical condition of the reservoirs and ponds from which the supply is drawn, the consulting chemist, an assistant sanitary inspector and assistant sanitary engineer, reported that: "During the early spring vegetation was unusually early and vigorous, owing to an early appearance of warm weather, and this was still further favored by an abundance of wet weather, especially in July. Following this unusual growth of grass, algae, etc., both in the water and around the ponds, there came an unusual long period of very hot weather, during the latter part of July and the early part of August, which killed much of the growth of the earlier part of the season, or led to its being attacked by various kinds of parasitic organisms of both vegetable and animal character. Rapid decom-

position and disintegration was the result, giving to the water and the shores of the ponds very much of the odor that is generally observed along the seashore where seaweed is being washed ashore. The conditions are very much alike in the two cases. To add to the odor, per se, of the decomposing weeds and grass, there is another source of odor in the myriads of parasites infesting this mass of dead material. The growth of these parasites, as above stated, was stimulated by the long continued high temperature of the water, during the recent warm spell. It is well known that many of these infusorial organisms impart to the infusion in which they grow a very disagreeable and even a fishy odor. This we believe to be the origin of the disagreeable taste and smell of the water at the present time. In support of this belief, we may say that the masses of this decaying vegetable matter, of which there is a very large supply in some of the ponds, have the odor characteristic of the water. We noted also, that the water of these ponds where this material is the most abundant has the strongest odor and taste, and the most of the yellow color. For the purpose of more careful scientific study of the chief organisms concerned in producing the peculiar odors, we have collected samples of the vegetable refuse floating in the water and turned them over to the bacteriologist of this department. The remedy for the trouble we have briefly described above is not difficult to conceive. The only remedy that suggests itself to us is to clean out the ponds, and rake out the dead grass, weeds and algae. While this is being done, the ponds where the work is going on should be cut off from use, until the work in that pond is complete and the water has had time to settle."

Prof. A. R. Leeds has since reported to the City Works Commissioner in part as follows:

"From experiments which could not be detailed here, it appears that the principles which impart the odor are a volatile amides belonging to the aromatic series of organic compounds. Those which impart the taste are amides, also, of closely related composition, but of less volatility and probably of less solubility. From these data it will be seen that the free and albuminoid ammonia are present in very small amounts in most of the samples. But the nitrates are present in enormous quantities, making the lowest ratio in which the mineral nitrogen is greater than the organic nitrogen, the large ratio of eight times, and yet, in one instance, it mounts up to the stupendous figure of 128 times.

"In connection with the small amount of albuminoid ammonia, it should be brought prominently into view that in their normal and usual condition, the Brooklyn water contains this constituent in exceedingly minute quantities. *In fact, the Brooklyn water in its ordinary state should be ranked as first in regard to purity of any of the water supplies of our principal cities.* This encomium is made deliberately and advisedly and is based upon a comparison of the analyses, spread over twenty-six years, of the water supplies of all the important towns in this country and Canada. But, in its present condition, it has been a peculiarly favorable habitat for the multiplication and growth of these vegetable organisms, which in turn have secreted the products that have rendered the water turbid, and, in course of their decomposition, have originated the foul tastes and odors."

(The italics are ours.)

The fortunate accession of cooler weather and colder water has so abated the activity of the process of putrefaction that, at the time of this writing, the offensive odor and bad taste of the water are no longer present. Meanwhile the Department of City Works appears to have entered upon the work of cleansing the reservoirs, ponds and streams with such vigor as to encourage the hope that all the tributaries to the supply may be so efficiently policed—as they have never been hitherto—and the effort to keep them clean so continuous as to prevent the recurrence of any like evidence of disgraceful negligence hereafter.

DR. SUSAN R. PRAY, of Brooklyn, has earned a foremost reputation as Assistant Sanitary Inspector in the Health Department of Brooklyn, while she has ever been mindful of animal as well as human suffering. It is with a vivid recollection of her call upon us, seven or eight years ago, for consultation with reference to her then declared intention of gaining the position of Sanitary Inspector, and her determination to strive for the office on the basis of thorough competency, as opposed to political preferment. On it she won, and we have never lost sight of her and her example from the time of her appointment—first as vaccinator and six months subsequently Assistant Sanitary Inspector—six years ago, and her industry in effective work. At the outset: "Why, she can vaccinate more children and do it more effectually in two days than any other inspector can in three," were among the first words of commendation reported of her by one of her co-ordinates. Her other service has been in about the same propor-

tion. Meanwhile she has ever been alive to circumstances—not satisfied with mere passive vision—but *looked at* them and exercised her impulses for good. By this she has gained a wide reputation in the practical application of her sympathy for animal suffering, while she has maintained a foremost rank in the performance of her duties in the promotion of the public health, insomuch that it is now reported of her that if any one in her neighborhood has a sick kitten or puppy, he or she takes it to Dr. Pray for advice or treatment.

Dr. Pray received her medical degree from the Woman's Medical College of New York in 1882. She subsequently took a post-graduate course in surgery, and after practicing four years in New York and Brooklyn sailed for China, where she expected to devote her life to missionary work. She remained a year in China and at the expiration of that time was obliged to return to this country on account of her health. Fortified by such opportunities and having always traveled with her eyes open, she had laid a good foundation for the study and practice of the noblest part of the profession—that of preventive medicine, to which she is now devoted.

THE SOCIETY FOR THE PREVENTION OF HEREDITARY DISEASES is the newest output in the field of preventive medicine—a worthy purpose and a brave venture. The projector and president of the society is Miss A. Barnard, of No. 65 East Fifty-ninth street, New York. The purpose is set forth in the constitution, of which the following is an abstract:

"We, the members of this association, believe it to be a crime against society and future generations for certain persons to marry. We each solemnly pledge ourselves not to enter into any matrimonial alliance with any person whose family is subject to such hereditary diseases as consumption, insanity or the appetite for strong drinks, knowing that each individual is responsible for the physical perfection of hundreds yet unborn.

TYPHOID FEVER IN SEASON.—Typhoid fever is an autumnal disease, due to a germ that flourishes at this season of the year, though under particularly favorable circumstances, liable to occur in any season, and is chiefly propogated by polluted water and milk—unfortunately, so frequently and so commonly by polluted water that it scarcely seems necessary to refer to special examples. All readers will recall the famous epidemic of Plymouth a few years ago, that of Duluth last year and the one not yet over, of Elmira;

and for continuous examples, reference may be made to the Mortality and Morbility Reports and Reviews on other pages of this number, and indeed under the same head in every number of this magazine.

The more notable milk epidemics of typhoid fever in recent years, of which accounts have been given in these pages, to which reference may be made *au courant*, have been the one at Springfield, Mass. (150 cases and 25 deaths, in 1892); the outbreak in Montclair, N. J. (115 cases and 15 deaths, in 1894), and the memorable epidemic at Stamford, Conn. (386 cases and 22 deaths), in 1895. In the first two of these it was clearly shown that the infection proceeded from the premises of a milkman or dairy farmer. At Stamford the germs were introduced into the pails or cans of one milk dealer from a very foul well, the water of which had been infected by drainage from adjoining premises. In Cambridge, Mass., as may be seen on reference to Massachusetts, on another page, the epidemic now prevailing also appears to have been caused by polluted milk supplied by one dealer, whose delivery agent was affected by what is known as a "walking case" of typhoid—a case of so mild a type that he has not been prevented from doing his daily work. The investigation of this outbreak is in progress. There are no more complete and interesting reports of inquiries concerning the sources of infection in milk epidemics of typhoid than those of Prof. Sedgwick of the Massachusetts Board of Health relating to the epidemics at Springfield and Somerville, and this one is likely to be equally complete.

Evidence relating to 50 outbreaks of typhoid due to the distribution of infected milk previous to 1881 have been collected by Ernest Hart of London. Dr. R. G. Freeman of New York has added the history of 53 more, which occurred between 1881 and 1895. During these 53 epidemics there were about 3,200 cases, of which nearly 300 were fatal. Dairy farms, dairies, and the premises of milkmen should be constantly subject to sanitary inspection by the health authorities.

Poisoned by Canned Salmon.—Six of the seven Little Sisters of the Poor who teach in the parochial school attached to the Church of St. Francis de Sales, Brooklyn, were taken ill September 11th, a short time after they had partaken of some canned salmon, which was purchased in a nearby store. The symptoms of all were identical. There were pains at the pit of the stomach, all the indications of acute gastritis and vomiting. Their condition

was so alarming that a physician was called in. The seventh of the Little Sisters, who had not partaken of the salmon, was not taken sick. Although the doctor was not able to obtain a specimen of the salmon for examination—all that was left having been thrown away—he was satisfied of the cause of the illness. The poisoned ones suffered greatly for about forty-eight hours, when they began to improve, and all recovered. The doctor was of opinion that no person was to blame, that the occurrence was an accident due to conditions liable to develop in canned food, even under the most careful preparation.

CHOLERA.—A single case has occurred on board the U. S. S. *Boston* at Shanghai. It was that of a sailor who contracted the disease while on shore leave.

FIRE ISLAND TO BE SOLD.—It never should have been bought by the State and would not have been but for the outrageous proclamation of the President in1892, to retain infected ships and persons who had been exposed to cholera twenty days, incited by the ambition of the Marine Hospital Service to gain control of the New York Quarantine. The purchase was a counter effort to foil that attempt. The plant of the quarantine establishment in the lower bay, efficiently equipped as originally intended and as it has since been, is, under intelligent management, sufficiently elaborate to deal with all quarantinable vessels and diseases liable to arrive at this port. The unintelligent action which led to its purchase has cost the State $250,000. It will not probably now sell for over one third of that sum. But it has served its purpose. How much the useless *low* plant, on Sandy Hook, instituted under the supervision of Ex-Surgeon-General J. B. Hamilton of the Marine Hospital Service, in the effort to subvert the State quarantine, is worth will not probably be put to the test—it is a government investment.

THE DANGER OF INFECTED MATERIAL.—Three years ago, it is reported, there was a fatal case of diphtheria in the family of S. C. Moore, of Kokomo, and the lounge upon which the child died was stored away. A few days ago Mrs. Samuel Sipe, of Pittsburg, Pa., visited the Moore family, and her children used the lounge. Both contracted diphtheria.

PECUNIARY RESPONSIBILITY FOR ISOLATION OF PERSONS AFFECTED WITH CONTAGIOUS DISEASES.—There is a close harmony between law and common sense in the recent decision of Judge Albright at Allentown, Pa., that when the city authorities confine

or isolate a family because of the existence of a case of *contagious* disease, the city must pay for the sustenance of the family. The occasion for the decision was the refusal of the authorities to recompense a grocer for supplies furnished to a quarantined family, on the ground that there was no express power to pay for such expenses. The matter is above a city regulation, Judge Albright says. The isolation is by exercise of the police power delegated to the municipality by the State, and the same grounds—humanity and the preservation of life—which warrant the quarantine, point out the duty of the municipality to furnish supplies.

THE SMEAD SYSTEM OF CLOSETS, after thorough investigation, has incurred another condemnation, this time by the Youngstown (O.) Board of Health. At a recent meeting of the Board the Secretary was instructed to notify the Smead people to appear at once and remedy the evil. The system is intolerable. Its only effectual remedy is exclusion.

CYCLING IN ENGLAND, Dr. Turner declared, at the recent Sanitary Congress at Newcastle, had raised the average health of women, and was a better exercise than golf, tennis or skating as a means of promoting a wholesome action of the skin. He gave advice respecting dress, diet, machines and saddles; condemned racing, and laid a proper degree of emphasis upon moderation. Cycling does not require the sanction of the Sanitary Congress for either sex in England; it is the most popular form of recreation for all classes, and is steadily gaining ground.

THE WHEEL VS. INTEMPERANCE.—This year one million wheels will be sold in the United States alone. This means that $70,000,000 will be spent for exercise, which would, in large proportion, have gone for dissipation and disease in the form of drink and tobacco. The liquor men are wailing bitterly, and trade statisticians claim that seven hundred millions less cigars will be consumed this year because of the widespread reign of the wheel. God speed it!—*Ram's Horn.*

THE AMERICAN PUBLIC HEALTH ASSOCIATION.

The Twenty-fourth annual meeting of the Association, held at Buffalo, N. Y., September 15th-19th, 1896, was an average convention with regard to the number registered, 185, but excessive in the number of papers read—to the exclusion of some that should have been read. Indeed more care is required by the Executive

Committee than was taken for this meeting in both the selection and classification of papers to be read and discussed, if the character of the Association is to be maintained for progressive work. Several papers were read that should have been omitted, or referred back with encouraging notes, to their authors to continue the prosecution of the subjects they had undertaken, rather than permitted to take up the time and prohibit discussion, to the exclusion of such papers as those presented by Prof. Robinson and Dr. Kinyoun on Formic Aldehyde, the report of the Committee on the Pollution of Water Supplies, and others, cut short or wholly crowded out by the admission of elementary subjects.

The sessions were held in the admirably appointed Ellicott Square Building.

FIRST DAY.—The morning session was called to order at 10 oclock, Dr. Eduardo Liceaga of the City of Mexico, President, in the chair, but on account of the president's unfamiliarity with the English language, Lieut. Col. Alfred A. Woodhill, Medical Department, U. S. Army, First Vice-President, sat beside him and conducted the duties of the President, during the meeting. The Rev. T. R. Slicer offered a prayer, after which Dr. Ernest Wende, health commissioner of Buffalo and chairman of the local committee announced the entertainments that had been arranged for the delegates during their stay in Buffalo.

The Secretary read the report of the Executive Committee. The appointment of a committee on sanitation was recommended, with special reference to drainage and plumbing of public and private buildings, the special committee to consist of five members, appointed by the chair. It was further suggested that a committee of the same size on disinfectants and disinfection should be appointed by the chair. The report was adopted.

Next followed the election of about 50 new members.

The President announced that, owing to the large amount of business before the association and the large number of papers to be presented during the convention, 20 minutes only would be allowed for the reading of papers, and five minutes to each speaker in discussion, and that no member of the association would be permitted to speak more than once on the same subject.

Report of the Committee on "Car Sanitation," Dr. Granville P. Conn, chairman, was read.—It was long, though read only by abstract of its most important points.

Dr. Domingo Orvananos of the City of Mexico read a paper on

"Observations on the Cleaning of Railroad Passenger Cars." This was followed by a paper on "Possibilities of Contagion of Venereal Diseases in Railway Cars," by Dr. Tomas Noriega. This paper told of many frightful cases, contracted through contagion in cars. It gave a number of instances which had come under the author's personal supervision, and suggested some ways by which this evil might be largely prevented at slight expense to railway officials. Dr. F. C. Valentine of New York, Dr. Gihon of the Navy and Dr. Kinyoun of the Marine Hospital Service spoke on the subject.

Dr. Frederick Montizambert, superintendent of quarantines of the Dominion of Canada, presented the report of the Committee on Steamboat and Steamship Sanitation. Dr. Horlbeck of Charleston and Dr. Gihon spoke on the subject. Suggestions were made as to the best means of ventilating steamships and preventing contagion. It was decided at the close of the discussion to continue the committee on car sanitation.

On motion of Dr. Gihon, it was voted to send a telegram of sympathy to Dr. Sewall of Denver, Second Vice-President of the Association, expressing the Association's regret at his illness and its fervent hope for his speedy recovery.

Afternoon Session. The first paper read was on "The Composition and Infectiousness of Milk," by Dr. James F. Kennedy of Des Moines, Secretary of the State Board of Health of Iowa. He went into considerable detail with regard to the composition of milk and its superiority to any other single food in the maintenance of life. The excessive death rate of children fed on cows' milk, he said, was in great measure due to inanition, the milk being deprived of its nutritious qualities by dilution with water, which is not only a fraud against the buyer of the milk but a crime against the children who have to drink the milk, for they are literally starved to death. Yet, he thought that the greatest danger from milk was not from its dilution, but from the disease germs which it might contain and carry to human beings. He mentioned tuberculosis as one of the most important of these diseases, and one which was frequently transmitted in this way. Typhoid fever is also carried by milk, which may be infected by washing the cans or diluting the milk with polluted water, by the cows drinking polluted water and by other means of infection. Diphtheria and scarlet fever are also carried in milk. He urged the most careful and rigid inspection of all sources of milk supply and the dissemination of information re-

garding the dangers of infection from this source, also that all milk used should be thoroughly sterilized.

A paper was announced on "Pure Milk," by Dr. Gardner T. Swarts of Providence, Secretary of the State Board of Health of Rhode Island, but instead he spoke to the subject only, not having prepared any paper. He recommended for the purification of milk supplies that farms should be established, similar to one that is near the City of Buffalo, where all of the modus operandi of milking and delivering the milk is carried out under the most healthful conditions, and the purity of the milk is certified to by reputable physicians. The price of such milk, he said, must of necessity be higher, and it is only by educating the public that they can be made to pay the difference and so secure immunity from disease, which is more surely secured this way than by sterilization.

Dr. D. E. Salmon, D.V.M., chief of the Bureau of Animal Industry of the Department of Agriculture at Washington, presented the report of the committee on "Animal Diseases and Animal Food." He reported that the European disease of anthrax, a most fatal malady, is becoming more prevalent in this country, and suggested means for suppressing it, by carefully burning the bodies of all animals that die from it, instead of leaving them where the contagion could be spread to others or conveyed to the soil. Tuberculosis, he said, is now the subject of much attention on the part of the Government, which can, however, only prohibit the shipment of diseased meat to other States, and not its local sale. Most of the large abattoirs, however, will not place on sale meat which the Government inspectors have declared unhealthy, but some of them still do so.

A portion of the report dealt with rabies. Dr. Salmon held that the opinion of many that no such disease exists is false, and that it not only exists, but is a common menace to public health and safety. He recommended the destruction of all worthless dogs and the muzzling of all others allowed to run at large.

The discussion which followed the group of papers was joined in by Dr. Lee of Philadelphia, who took issue with Dr. Kennedy regarding the sterilization of milk and declared that it caused rickets and infantile scurvy, both of which diseases had become comparatively common since the introduction of the scheme of sterilization. Dr. Hibbard of Indiana did not think that any cases of tuberculosis could be traced to milk supplies, and Dr. Lyman of Massachusetts said that the best means of preventing such contagion

was not only to look out for the quality of the milk, but to get plenty of pure air, proper food and clothing and sufficient sleep and exercise, so as to keep the body in a healthy condition. Dr. Carter of Des Moines thought the shotgun was better than the muzzle for the prevention of hydrophobia. Dr. Holton of Brattleboro, Vt., thought the talk about tubercular infection in milk was likely to alarm the public unnecessarily. Dr. Kenyoun cited cases of infection of tuberculosis from milk, and Dr. Salmon replied to Drs. Hibbard and Holton in a similar strain.

A paper on "Contributions to the Study of the Pathogeny, Etiology and Prophylaxis of Typhus," by Dr. Francisco De P. Bernaldez, of Oaxaca, Mexico, was read by Dr. Kenyoun. A report on "Nomenclature and Forms of Statistics," by Dr. Samuel W. Abbott Secretary of the State Board of Health of Massachusetts, Chairman of the Committee, was read by Dr. A. Walter Suiter of Herkimer, N. Y.

A paper on the "Nomenclature of Diseases and Forms of Statistics," by Dr. Liceaga, was read by his son, who speaks English fluently.

Dr. Jesus E. Monjaras of San Luis Potosi, Mexico, followed with a paper on the "Need of Uniformity in the Meaning of the Term 'Stillborn.'" He was followed by Dr. Henry R. Horlbeck, health officer of Charleston, S. C., who presented a paper on "Dengue or Breakbone Fever," a disease prevalent along the Southern coast.

The final paper of the session was on "Municipal Responsibility for Healthful School-houses," by Mrs. Ellen H. Richards, of the Institute of Technology, Boston, read by Dr. S. H. Durgin. It took the ground that the city is just as responsible for the safety of those who are compelled to remain in its buildings as it is for the safety of those who have to cross its bridges.

Evening Session.—The meeting-room was well filled when Vice-President Woodhull introduced Mayor Jewett, who welcomed the Association to Buffalo in a neat address and extended to the members of the Association an invitation to inspect the administration of the City's affairs, so far as they relate to the public health.

Mayor Jewett was followed by the Rev. Thomas R. Slicer, who said, in part:

"When a layman is asked to speak to experts on a subject connected with their field of work, he is apt to get into deep water unless he chooses as his theme a portion of their field that is crossed

by his own field of labor. I therefore address you to-night simply as a citizen of the city of the lowest death rate in the United States, who is interested in conserving the public health of that city to a still greater extent.

"The word city is the watchword at once of your opportunity and your peril. You all have seen the dwellers in the country violating all of the rules of health and seemingly being themselves healthier than those who live in cities. But add to the group of those in the country another group and then another and another, until you have taken away some of those elements of health, fresh air, room and opportunity for healthful work and pleasures, and you have a city, in which those who live must suffer for their violations of the hygienic laws, and as the city grows there also grow up the tenement-houses which make impossible the four fundamental conditions of existence, for I hold that every man is entitled to these four things: A place to sleep, enough to eat, comfortable clothing and the privilege of being alone. In these great buildings—I would call them dens were they not inhabited by human beings, I would call them hives but that their inhabitants have neither the industry nor the wisdom of the bee—in these buildings these fundamental conditions are impossible.

"In the grouping of so many together there is a sense of power that is not found in the country. It is because of this sense of power that lies in the binding of lives together that we at once should have a sense of insecurity and a hope of power. But, more than this, there is that civic consciousness which belongs to every city. Buffalo, as an example, has no civic consciousness. It has not the civic consciousness which marks Birmingham, Glasgow or even Chicago. It is, as far as we have gone, a group of contiguous tribes. I do not now refer to their nationality, though that is also true, but to their diverse interests, to their alien training, to their want of common purposes in this city. Chicago would not be where it is to-day were it not for its civic consciousness, and if it had not had the opportunity of the Columbian Exposition.

"Until civic consciousness arrives in municipal life it is almost a continuous upgrade for the guardians of the public health. There is a constant warfare with ignorance and avarice. Who that owns a large tenement but has said that his house was his castle and has tried to keep the health officer out? Some of us do not know enough to protect ourselves against contagion.

"Let me add in conclusion that the Health Department of any

city has no business at that trough from which the politician feeds. How many of you have not come in contact with that parsimony that will deny $1,000 for a bacterioligist and spend $2,000 on a junketing trip for a Board of Aldermen?"

Dr. Slicer's remarks were received with applause. The programme had provided for an address on behalf of the Canadian members of the Association by the Hon. Richard Harcourt, Provincial Treasurer of Ontario and Minister of Health, but in his absence Dr. P. H. Bryce of Toronto was called upon to fill the vacancy, which he did acceptably in a brief address.

Next followed President Liceaga's address. It was written in English and read by Dr. A. L. Gihon, U. S. N. After referring to the business of the Association he gave an account of the growth and development of the study of public hygiene in Mexico, which he said had been fostered and encouraged under the administration of President Diaz during the last 20 years.

Some of the suggestions made by Dr. Liceaga were of much practical interest: That the Association should devote special attention to the study of contagious diseases, with a view not only to their cure and the prevention of epidemics, but to public means of preventing the development of individual cases. That isolation in infectious diseases is not so essential in some diseases as in others, and that the study of the extent to which it should be practised would repay investigation. That more attention should be paid to the study of the technique of disinfection. These and many other phases of the broad subject of contagion could be studied by uniform methods over a vast extent of territory by the members of the Association, with benefit.

He recommended more attention to the periods of incubation of contagious diseases, with regard to which much uncertainty still exists, and definite knowledge in this regard would be of incalculable value. He recommended that a special committee for the investigation of the subject of the prevention of disease, particularly by vaccination and inoculation, should be appointed, and refered to the newly-developed treatment by inoculation with serum, which he declared was already falling into disrepute through the use of imperfect or contaminated serum. A committee to devise a means for the use and sale of only absolutely pure and perfect serum should be appointed, he declared. In conclusion Dr. Liceaga said:

"Gentlemen of the American Public Health Association; I beg to offer you my sincere congratulations on our coming again to-

gether in the 24th meeting of this Association, and on having selected for the place of our meeting this beautiful and interesting city, which is so splendidly placed at the eastern end of this delicious lake, a lake that supplies the water for this powerful river that farther on precipitates itself in a grand cataract, a stupendous marvel of nature that thousands of pilgrims from all parts of the world come to contemplate and admire; in this city which offers to us its hospitality and affords us an opportunity of again meeting to render our homage to science and to work together for the physical well-being of our fellow-creatures."

SECOND DAY.—*The Morning Session* was for the most part taken up with one of the most important subjects of the meeting: "The Disposal of Garbage and Refuse." Rudolf Herring, C. E., of New York, presented the report of the Committee, of which he is chairman, comprehending the subject in general.

Col. William F. Morse of New York read a paper on the same subject, but chiefly confined to the domestic disposal of garbage by means of a cremator attachment to the stove-pipe, turning the solid portions of the garbage into charcoal while evaporating the liquids, of which he showed the device.

Dr. M. E. Wordin of Bridgeport, Connecticut, read a paper on "A Plea for the Domestic Disposal of Garbage," comprehending the same means as the preceding and exhibiting several devices, and showed their adaption. One of the models, which was on exhibition in Buffalo, he said, was an apparatus which could be used to great advantage in the country, in military posts and in other places where other means were not available. The model to which Dr. Wordin referred could be used both for garbage and for other refuse, successfully disposing of all refuse by consumption by fire.

Maj. William S. Tremaine of the medical department of the United States Army, retired, was down on the programme for a paper on "Disposal of Household Garbage and Excrement by cremation." On being called for, he said that so much of the contents of his paper had been embodied in the previous papers, that he would not read the paper he prepared, but would give instead a short talk, giving a few facts which were not included in the instructive papers previously read.

"In driving downtown the other morning," said Dr. Tremaine, "I was sorry to see in front of many of the beautiful lawns that are Buffalo's pride and glory, filthy, reeking swill-barrels and garbage-cans. I was particularly sorry to see these propagators of disease

marring the beauty of our streets at the time this association was in Buffalo. This matter of the disposition of garbage should be under municipal control and the health commissioner of the city ought to be the one to have the matter in charge."

Dr. Tremaine then went on to explain the results of his practical experiments with one of the garbage cremators shown by Dr. Wordin, which, said he, was in use in Buffalo, although not very extensively.

The Doctor said that the crematory successfully disposed without any odor of both garbage and excrement, and that in his opinion it was, if anything, superior to the flush closets used in modern houses. He said that one of these cremators had been used in a factory for this purpose with very satisfactory results.

In concluding his talk, Dr. Tremaine spoke in disapproval of the family swill pail, which, he said, was not only a menace to the health of the family, but to the health of the residents of Buffalo.

Then the matter of the disposition of household garbage was thrown open for discussion.

Dr. Gihon was the first speaker. "The best way of disposing of the greater part of the household garbage," said he, "is to eat it." He told of a friend in France who had a cook who understood the exact eating capacity of his family. There was never anything but bones and the merest scraps, such as could readily be burned, after meals. The family came to this country, settled down to housekeeping in Boston and for the first time in his life the man found his household provided with a swill pail. As a consequence, his household expenses doubled. "We provide more than we can eat. Let us remedy that and we will have solved half of the refuse problem."

Gen. Sternberg spoke concerning the contamination of food by flies, and said that it was by no means an infrequent cause of the spread of disease. Diphtheria, cholera, and other germ diseases, he said, could very often be traced directly to flies.

Others who joined in the discussion were Dr. Edward Clark of Buffalo, Dr. Lee of Philadelphia, Dr. Carter of Des Moines, Dr. Mitchell of Trenton, Dr. Durgin of Boston, Dr. Lucien Howe of Buffalo, Dr. Lewis and Dr. Morse of New York and Dr. A. N. Bell of Brooklyn.

The condemnation of the existence of swill-pails and garbage cans was unanimous.

Dr. Benjamin Lee of Philadelphia, read a paper on "The Quick

and the Dead." "How far should the dead be allowed to interfere in the affairs of the living?" This question gave point to his paper. "This he said," is a purely legal question which we need not stop to consider. It has ever been decided, however, in but one way, except by Utopians. An advancing civilization, more thoroughly permeated with the spirit of Christianity or, as it is now fashionable in some quarters to call it, Altruism, will some day reverse this decision.

"There is another question, however, which more directly concerns us. That is: How far are sacrifices to the dead desirable or allowable? We shudder when we read of the immolation of the Buddhist widow on the funeral pyre of her husband, or of the slaughter of hundreds of slaves to solemnize the funeral ceremonies of some savage chief; the pagan sacrifices to propitiate the spirit of the dead and thus avert the evils which it might cause the survivors, and in the second place to demonstrate to others the regard and affection which those who make the sacrifice had toward the one who has gone.

"The particular form of sacrifice against which I wish to enter my protest, however, is the offering up of human beings to the dead by means of the infectious germs in the bodies and vestments of the latter. This form of sacrifice is accomplished by exposing the body of the dead with face uncovered and calling in the public to become infected. Children are oftenest selected as victims of this rite, and their immolation is sometimes further assured by inducing them to kiss the face of the dead. In some instances, in order to insure a larger number of victims, infectious bodies are transported hundreds of miles and then again exposed to procure new sacrifices.

"All sanitary authorities are earnestly opposed to this ruthless sacrifice of human life. They feel that their duty is to the quick, rather than to the dead, and that the bier should not be converted into an altar on which the living may be offered up. To this end we should make efforts to prevent public funerals in the cases of those dead of contagious diseases and to put an end to these unnecessary deaths.

"The true solution of the problem is the cremation of all contagious corpses. The ashes of such a body can be carried anywhere without danger. It would be well for all if we could quit our habit of thinking that what we say of the dead or our conduct to-

ward them is of more weight than what we say of the living or our treatment of them."

Report of the Committee on Transportation and Disposal of the Dead was presented by the Chairman, Dr. Charles O. Probst of Columbus, O., Secretary of the State Board of Health of Ohio. The committee was of the opinion that it is quite possible to prepare a body, dead of an infectious disease, so as to make it transportable without any danger of infection, and that it is the duty of the association to develop the simplest methods by which this end can be attained, in order that the sentiment of respect for the dead may be maintained without danger to the living. If, however, all dead bodies are to be allowed transportation, it would be necessary, the committee thought, to provide that the preparation of bodies should be made under the supervision of the proper health authorities. "The friends accompanying the dead," concluded the report, "are often more dangerous than the corpse."

The Afternoon Session began by a paper "On Measures for the Prevention of Blindness," by Dr. Augustin Chacon, of Aguas Calientes, Mexico, this followed by "Miasmatic Fevers in the State of Sonora," by Dr. Alberto G. Noriega of Sonora, Mexico, and "Summary of Sanitary Legislation in the State of Mexico," by Dr. Maximiliano Alvarez of Mexico. "Paludism in the State of Morelos and its Prophylaxis by Sanitary Measures," by Dr. Angel Gavino of Morelos, Mexico. All of these papers were read by Dr. Gihon. That of Dr. Chacon declared that a large percentage of all cases of blindness was preventable and recommended means of preventing the same, by particular attention to the books used by children in school, as to the size of type, color of paper, length of lines and distance between lines. He also recommended that regulations to govern the sale of spectacles similar to those regulating the sale of drugs should be adopted, so that the relation between oculist and optician should be the same as between physician and pharmacist. In discussing the paper, Dr. Lucien Howe of Buffalo agreed with Dr. Charcon in regard to the proportion of cases of unnecessary blindness, and introduced two resolutions, which were referred to the executive committee. The resolutions recommended the adoption of Crede's method of preventing blindness by putting a drop of nitrate of silver in the eyes of newly born infants, in all institutions supported by the public, and approve the laws requiring the reporting of all cases of purulent ophthalmia in the new-born by nurses and midwives.

Next followed papers; "Obiter Dicta Concerning Sanitary Organization," by Dr. A. Walter Suiter of Herkimer, N. Y.

"Some Thoughts Relative to National Health Legislation," by Dr. U. O. B. Wingate of Milwaukee.

"The Sanitary Administration of Unincorporated Districts," by Dr. Henry Mitchell of Trenton, N. J.

Report of the International Committee on the Prevention of the Spread of Yellow Fever, by Dr. Felix Formento of New Orleans, Chairman of Louisiana.

"Contribution to the Study of Yellow Fever." by Dr. Eduardo Liceaga of the City of Mexico.

"Contribution of the Study of Yellow Fever—Epidemic in Cordoba," by Dr. Gregorie Mendizabal, Vera Cruz.

The Evening Session afforded time but for one paper only, "On Isolation Hospitals," by Dr. John L. Leal, of Paterson, N. J., Health Officer of Paterson, and too little discussion, when it adjourned to attend a very enjoyable reception at the Ellicott Club.

The Mexican delegation, 35 in all, held a banquet at The Iroquois in commemoration of the 25th anniversary of Mexican independence.

THIRD DAY. *Morning Session.* Major Charles Smart, Surgeon U. S. Army, Chairman, read an abstract of the Report of Committee on the "Pollution of Water Supply." (It is our purpose ere long to publish this report in full). Other reports and papers read in whole or part, were: Report of Committee on "River Conservancy Boards of Supervision," by Dr. Peter H. Bryce of Torono, Canada, chairman.

Report of committee on "Protective Inoculation in Infectious Diseases," by Dr. Charles N. Hewitt of Red Wing, Minn., Chairman.

Papers on "The Serum Diagnosis Test for Typhoid Fever," by Dr. Wyatt Johnston of Montreal, Canada, bacteriologist to the Provincial Board of Health of Quebec.

"Prophylaxis of Typhoid Fever," by Dr. J. Eliot Woodbridge of Cleveland, O.

"Practical Use of Formic Aldehyde as a Disinfectant," by Prof. Franklin C. Robinson of Brunswick, Me., professor of chemistry in Bowdoin College and member of the State Board of Health of Maine. (It is our purpose to publish this paper in full ere long.)

"Preliminary Note on the Use of Formaldehyd for Room and Car Disinfection, etc.," by Surgeon J. J. Kinyoun, U. S. M. H. S., of Washington, D. C.

"A Convenient Lamp for Generating Formaldehyde Gas," E. A. De Schweinitz, M. D., Ph. D., of the Bureau of Animal Industry, Department of Agriculture, Washington, D. C.

"On Prophylaxis of Paludism," by Dr. Alfonso Ruiz Erdozain, of Hidalgo, Mexico.

"Brief Notes on Public Hygiene in the State of Tamaulipas," by Dr. C. Laredo, of Tamaulipas, Mexico.

"Public Health in Tabasco, Mex.," by Dr. Juan Muldson of Tabasco, Mexico.

"Sanitation in Hospitals for the Insane," by Prof. George H. Rohe of Springfield, Md., Superintendent of the Second Hospital for the Insane of the State of Maryland. (By title, the author not being present.)

Afternoon Session. Report of Committee on "The Cause and Prevention of Diphtheria," by Dr. J. J. Kinyoun, Chairman.

Papers on "Diphtheria in Chihuahua," by Dr. Miguel Marquez, of Chihuahua, Mexico.

"Bacteriological Diagnosis as Governing the Admission and Discharge of Patients in Diphtheria Hospitals," by Prof. E. B. Shuttleworth of Trinity Medical College, Toronto, Canada.

"Should Measles be Quarantined?" by Dr. Henry M. Bracken, professor of materia medica, therapeutics and clinical medicine in the University of Minnesota.

Report of Committee on "Causes and Prevention of Infant Mortality," by Prof. Charles N. Hewitt, Secretary of the State Board of Health of Minnesota.

Papers on "Mortality of Infants, the Causes and Means of Diminishing It," by Dr. Salvador Garciadiego, of Jalisco, Mexico,

"Diarrhoea of Children," by Dr. Jose M. Benitez of Guadalajara, Mexico.

Evening Session. Report of Committee on "The Use of Alcoholic Drinks from a Sanitary Standpoint," by Dr. Felix Formento of New Orleans, La., member of the State Board of Health of Louisiana.

The report took the view that the condemnation of all alcoholic drinks and confusing the moderate drinker of wine or beer with the habitual drunkard, by temperance agitators, was extremely harmful, and tended to increase the temptation to taste the forbidden fruit, and that the regular and moderate use of light drinks is the best means of combating the evil of drunkenness. In wine-growing countries, the report said, where wine formed a part of every meal,

there is no such thing as drunkenness. As the most practical remedies for the abuse of alcohol, the Committee recommended increasing the taxes on strong drinks, the prohibition of adulteration, the removal of all taxes on light wines, beer, cider and coffee, high city licenses, a sanitary inspection of all drinks sold over the bar, the encouragement of the culture of grapes and the manufacture of pure wines.

"The day that wine-drinking becomes prevalent," concluded the report, "drunkenness will become less prevalent. Meanwhile, all drunkards, instead of being merely fined or sent to jail where they can rest while sobering up, should be treated as criminals and punished by being put to hard labor."

Paper on "The Bicycle in its Sanitary Aspect," by Albert L. Gihon, Medical Director, United States Navy (retired).—A vigorous arraignment of the wheel as an adverse instrument to health by an observer who had evidently never rode a wheel. "It was only last year" he said "that I, a Washingtonian by residence, till then convinced that the Federal capital was absolutely unrivaled in her municipal glories, saw for the first time this beautiful city of Buffalo and forthwith succumbed to her irrestible charms, so that I was henceforth enslaved by two mistresses, and only knew how inexpressibly happy I could be with either when the other dear charmer were away. Now the fact that both alike, in their unsurpassed extent of smooth, broad, shaded avenues have been hotbeds for hatching prolific broods of the popular pet I was proposing to vivisect, makes me hesitate to say what I should in the plain terms the subject deserves.

"Narrow-minded," "prejudiced," "uninformed," "downright ignorant," are only some of the epithets with which I may expect to be pelted, so that it behooves me to declare at the very outset that I have not set out to assail the ideal bicycle and its ideal rider, the theoretical health and pleasure seeker who, by means of this wonderful apparatus which is now in unlimited styles and qualities offered for sale, rent, loan or gift, wherever one turns, is to be made strong and virtuous and consequently and correspondingly happy.

Living in a part of upper New York where the clean, broad, smooth pavements are almost as admirable and attractive for riders of the double wheel as those of Washington and Buffalo, I see—and see all the better that I am not one of the moving multitude—morning, afternoon and night and on to the very late hours of the night—what? A gliding throng which at first sight an Oriental

stranger might infer to be all men and boys, but on closer view is found to include both sexes and all ages. The much larger proportion of the unmistakable males are each contorted and distorted into a hideous caricature of the shape of man, a creature doubled upon itself, crouching as if in fear, its face peering intently and anxiously with contracted brows, compressed lips, pallid cheeks and restless eyes, its neck bent, its back curved into a curious hump, with chest and abdomen correspondingly hollowed, its thighs at an acute angle upon the trunk, its arms flattened and its legs working like the piston-rods of the steam-engine. Robert Grant poetically apostrophizes a specimen.

Oh, youth who, bending forward, rides apace
With melancholy stamped upon your face,
Pursuing pleasure with a frenzied eye.
Yet mocked by her, however fast you fly,
Are you aware how horrible you look?
No guy invented for a picture-book
Was ever a more painful sight than thou,
Lord of the bended back and anxious brow.
Oh, sit up straight and try to wear a smile!
Be less intent to pile up mile on mile!
Enjoy the prospect as you ride along—
The trees, the sunshine and the robin's song!
To us who view you scorching, day by day,
Bent on your bar in such an awkward way,
You are the homeliest thing on earth, my lad.
Oh, sit up straight and make the landscape glad!

As if to exaggerate the grotesque sight, at rare intervals there slowly passes a manly figure, erect, with ruddy, cheerful face and graceful pose, seated comfortably, as upon a horse, with arms drooping and leisurely treading upon the pedals as if walking, who, in all probability is a medical man, the exemplar of what a bicyclist ought to be, is claimed to be, but in fact is not. With him I have little fault to find. I am only contending that the average man and boy who rides to-day, the vast majority of all who do ride, are doing so at the sacrifice of health, under the pretense that they are seeking health.

The curious posture in which the daily newspapers and the periodicals devoted to wheeling interests represent the expert riders, the heroes of the wheel, which is effected by wheelmen's clubs and is consequently imitated by amateur boys and immature men and

which, indeed, the structure of the apparatus makes cumpulsory, is self-condemnatory and requires no disproval in this Association. The weight of the body which, in the normal act of walking, is wholly borne upon the femurs, is largely thrown upon the perineum, and though riders and writers and especially makers claim that it is supported by the feet and hands, I have been consulted too often by young men as to the best form of truss to wear, not to know that the region which nature placed where it would be safe from injury is subjected to the unavoidable stress of jolting and pressure in ascents. Even when the more serious contingency is provided against, the perineal space cannot escape being compressed, contused and shaken with the certain result of ultimate prostatic congestion, hypertrophy, stricture of the inclosed canal, cystic irritation and chronic inflammation.

If the habitual intemperate and irrational riders who constitute the greater class are not frank enough to admit the personal inconveniences which they suffer, and the sensations of faintness and actual pain, I can only say "The evil be upon your own head,"and prophesy that if they continue to ride as they are doing, not many years will elapse, especially if they have already reached the climateric, before they will be food for the specialist, who will reap a golden harvest from the seed they are sowing. Indeed, I can give no more significant hint to the young medical man choosing his field than to make the perineum and its adjacencies the subject of his especial study.

As a mere matter of personal hygiene, except from its remote effects upon the community, we might ignore the folly of the heedless bicyclist and allow him to suffer all the pains and penalties he pleases, but it is another matter when the welfare of that sex is concerned upon which depends the welfare of the race.

It is contended that the bicycle has wrought incalculable good for the gentle sex by taking them out of doors, where they pass hours in physical exercise, which they would otherwise devote to novel reading, inocuous desuetude and otherwise inactive indoor time-killing. Certainly the amazing revelations for which bicycle costumes and their involuntary displays are responsible, of spindle-shanks, knock-knees and less objectionable bow legs, are evidences of the lamentable lack of development and the necessity for the physical betterment of the unfortunate possessors of such slender unsubstantial understandings. It is true that very moderate daily pedestrian exercise would effectually develop the flaccid muscles of

support and progression, as well as improve the physique and round the outlines of the whole body, but the statement is made that the women, especially the young women of this country, will not like their more robust English, Irish and Scotch sisters, walk and be strong, and that, therefore, the bicycle is a commendable inducement to do in the name of pleasure what they will not do for the sake of health. Perhaps, too, I, in my fruitless battle against the abomination of corsets, ought to be grateful to the wheel for having indirectly accomplished the slackening of the tense cord that mercilessly binds, although with their Chinese sister martyrs, they all protest it does not, by the enlargement of the waist alleged to follow its use. But is even this good gain without compensating cost?

The human body has been most wonderfully supported on a pair of legs, which receive its weight and transport it in the most effective way, the very act of transportation serving also as the most perfectly devised exercise of the entire bodily structure. The hand is a wonderful piece of adaptiveness to intelligent purpose, but the human legs are scarcely less marvelously fitted for the needs of man in his relation with the exterior world. I have sufficiently indicated how the foolish rider — the rider whom the wheelmen's leagues denounce and discredit by resolutions, but who, nevertheless, is daily pictured as the typical rider — the wheeling celebrity — violates the physical conditions of his structure. Is it different with women?

Certainly very few flatten themselves upon their wheels and hump their backs. As a rule they sit upright, but this, in itself, is not necessarily safe. Listen to what an enthusiastic bicycling physician, an eulogist of the wheel, Dr. James F. Prendergast of Philadelphia, read before the section of Gynaecology of the College of Physicians of Philadelphia: "The ideal saddle has not yet been produced. Dealers and riding teachers in general are very ignorrant of the wants of women riders, and have no definite ideas as to their requirments or as to what a saddle should be like, and will recommend the most abominable saddles as ideals of comfort, simply to make a sale. The ideal saddle should be broad enough to sit upon with the weight carried on the tuberosities of the ischia; it must not produce pressure on the perineum or have a high peak; it should not chafe and produce saddle-soreness; it should be cool and springy enough to take up shock and vibration not so disposed of by the pneumatic tires." All of which I cordially commend to your most careful consideration. * * *

The majority of women riders are now using, from ignorance, from indifference, for economy, perhaps, the abominable saddle which it ought to be unnecessary for me to condemn to physicians, and I can only express my astonishment that any medical man can complacently see a young girl supported upon the edge of a wedge. The immature girl, mounted as thousands are to-day, has a future of misery and suffering. When no other saddle than that which Dr. Prendergast has outlined and which he himself states has not yet been produced shall be in use, one great objection to the wheel will have been removed. When adolescent girls, especially, shall be restrained to a very moderate indulgence in wheel-riding, it may even be commended. * * *

The discussion of the paper was opened by Dr. Carter of Des Moines, Ia., who declared that he had once entertained the ideas held by Dr. Gihon, but had been compelled to modify them. He had once predicted all kinds of dire effects from the use of the wheel by women, but now allowed his own wife to ride. As for riding slowly, one might as well tell a girl to go to a ball-room and not dance as to give her a wheel and tell her not to ride fast, while he considered the present forms of saddles for males all right, he advised the young women present to buy only such saddles as had horns.

Dr. Eliza Mosher, professor of hygiene in the University of Michigan, was the next to reply to Dr. Gihon. She said:

"As intemperance in bicycle-riding is likely to occur, the note of warning sounded by Dr. Gihon is not without value and we should profit as we may by the suggestions he makes. But I should be very sorry were we to leave the matter at this point. Some of Dr. Gihon's conclusions are not borne out by the facts.

"Why is the bicycle of value to women? It is because a woman can exercise out of doors in a position which I claim is peculiarly conducive to right development.

"Why is this the case? It is because the pelvis rests in its normal position of obliquity. In that position every organ hangs in the best position, from the organs of the pelvis to the brain itself. They occupy their own regions and do not interfere with each other. The walls of the trunk are held evenly. The hips are level and the shoulders parallel with the hips. The head is poised evenly on top of the erect spinal column. In that position, with the pneumatic-shod wheel, with the movement of the legs easy and in a direction that is natural, and using muscles which it is most important to de-

velop—those of the anterior thigh and the calf, which are necessary to poise the body upright in standing—we have woman in a normal posture, out of doors, carried from the place of her worry and work and filled with an exhilaration that takes the mind off those things that madden and drive them insane.

"Three years we have been watching these riders. Do they look unhappy? No. There are no happier faces to be found than among the women who ride the wheel.

"I have been practicing medicine for 21 years, and have had in that time what any one would call a large gynecological practice, and I have yet to see one single woman who has been injured by the use of the bicycle. In spite of all these harmful things which Dr. Gihon has mentioned, for they do exist, I have seen woman after woman and girl after girl recover from riding a bicycle from maladies of which I was unable to cure her.

"I appeal to you to vindicate the machine. Let us heed the timely advice which we have heard to-night, but let us not give it too much weight."

Papers on "The Part that Public Instruction should have in the Way of Precaution against Contagious Diseases," by Dr. Carlos Santa-Maria, of Durango, Mexico; "Public Bathing Establishments, with a Description of the New Public Bath in Brookline, Mass.," by Dr. H. Lincoln Chase, Agent of the Board of Health of Brookline; "Public Baths (Illustrated by Stereopticon)," by Dr. W. H. Tolman of the City of New York.

Dr. Chase's paper was a lucid description of recent improvements of public and schoolhouse baths, emphasized by the good results of their use.

Dr. Tolman's paper was an interesting historical sketch of the public bath, ancient and modern. Illustrations of some Buffalo tenement-houses, from photographs taken by the local health officials, were also shown in contrast with the wash-houses of London and Paris.

FOURTH DAY. *Morning and Last Session.*—The reports and papers presented and in part read, and read by title, were:

Report of committee on "The Relation of Forestry to Public Health," by Prof. Robert C. Kedzie of the Agricultural College, Lansing, Mich., chairman.

Report of committee on "Transportation of Diseased Tissues by Mail," by Dr. Henry Mitchell of Trenton, N. J., Secretary of the State Board of Health of New Jersey, chairman.

Paper on "Statistics of Vaccination and Mortality from Smallpox in the City of Mexico, 1872-1895," by Dr. Jose Ramirez, of Yucatan, Mexico.

Paper on "Drunkenness a Vice; It Should Be So Treated," by Dr. A. Nelson Bell of Brooklyn, editor of The Sanitarian. (Read in abstract; printed in full on other pages.)

Paper on "Municipal Cattle and Meat Inspection," by Dr. Peter H. Bryce of Toronto, Canada, Secretary of the Provincial Board of Health of Ontario.

Paper on "Municipal Cattle and Meat in Prisons," by Dr. Francisco Martinez Baca, Chief Director of the Anthropological Department, etc., in the Normal School of the State of Puebla, Mexico.

Paper on "The Relation of Noises to Public Health," by Dr. William C. Krauss of Buffalo, Professor of Neurology in the Niagara University.

Paper on "The Degeneration of the Human Animal Through the Nursery and Schools," by Dr. J. B. Learned of Florence, Mass.

Paper on "The Importance of Supplies of Pure Water," by Dr. J. L. DeHart of Brooklyn.

Paper on "Racial Deterioration," by Lawrence Irwell, M. A., B.C.L., Buffalo.

Paper on "The Necessity of Isolating Beds in Hospitals by Means of Windows Between Them," by Dr. Jesus E. Monjaras of San Luis Potosi.

Paper on "Filth Deposits with Regard to Public Health," by Drs. Jose D. Morales and R. E. De Guerrero of Mexico.

Numerous resolutions introduced during the several sessions were referred, as usual, to the Executive Committee for action.

Officers elected for the ensuing year: President, Dr. Henry B. Horlbeck of Charleston, S. C.; First Vice-President, Dr. Peter H. Bryce of Toronto; Second Vice-President, Dr. Ernest Wende of Buffalo; Secretary, Dr. Irving A. Watson of Concord, N. H. Treasurer, Dr. Henry B. Holton of Brattleboro, Vt.; Members of the Executive Committee, Dr. Henry Mitchell of Asbury Park, N. J.; Dr. U. O. B. Wingate of Milwaukee, Wis.; Dr. Jesus E. Monjaras of San Luis Potosi, Mexico.

Next Place of Meeting—Philadelphia.

To the disappointment of a majority of the members, the Advisory Council reported Toronto as the next place of meeting. To

this Dr. Plunkett of Tennessee moved an amendment, to sustitute Nashville—for reasons that may be referred to under Tennessee (Mortality and Morbility Reports), on another page.

Dr. Lee, Secretary of the State Board of Health of Pennsylvania, moved to amend the amendment, to substitute Philadelphia for Nashville. After considerable discussion and a mistaken vote—by many who only intended to vote on the acceptance of Dr. Lee's amendment, Philadelphia was declared to be the choice.

Dr. Liceaga made an eloquent speech in Spanish, which was translated by Dr. Cerena, expressing his high appreciation of the honor that had been conferred upon him by electing him President a year ago. He said he felt it was an effort on the part of the American Public Health Association to create a stronger bond of union between the United States of America and the Republic of Mexico. Dr. Liceaga expressed the hope that the bond of union between the two countries might be made immortal.

In closing his remarks Dr. Liceaga stated that it showed the interest which Mexico felt in the Association that the Mexican delegation represented every State of the Republic of Mexico. His address was received with hearty applause.

Dr. Gihon offered a resolution of thanks to Dr. Wende and his associates on the Local Executive Committee; to the Entertainment Committee, for the hospitality which had been extended to the delegates to the convention; to the Rev. T. R. Slicer, for acting as the Association's chaplain; to the Mayor, for offering his welcome and the freedom of the city; to the Ellicott Club, for its hospitality; to the Cereal Machine Company, for its luncheon, and finally, to the press of Buffalo, for its courtesy in sending representatives to the meeting of the Association at a time when so many other conventions were in session in Buffalo.

This resolution was adopted by a rising vote.

The Niagara Hotel should have been included in the vote of thanks. For next to Dr. Wende and his associates of the Local Committee who added the selection of this Hotel for the Headquarters of the Association to their efforts to render the meeting unusually enjoyable, no one contributed more to the success of that effort than the courteous Manager of the Niagara. Its delightful situation, airy and accessible to all that is most attractive in the city and roundabout, is but a fitting introduction to its comforts.

The SANITARY EXHIBIT, on another floor of the Ellicott during the meeting, was less extensive than we were led to hope it would be,

considering the effort to interest members of the Association in sanitary mechanics, fabrics, foods, etc., on which there is much need of information. The "Horlick Food Co's" exhibit was prominent at the entrance, and the excellence of their preparations is generally conceded.—"The Kery-Sprague Steam Pressure Sterilizer" (Richard Kery & Co., 17 Park Place, New York), "designed especially for the surgeon's office work," merits the attention of surgeons. "The Magoir's Cactus Fibre Bath Brush, made from the fibre of the long-leaved Cactus of Yucutan, more durable than hair, bristles, rubber or wood fibre, all which are rendered useless by boiling," (Moore and Reed, 13 Niagara street, Buffalo), was so commendable in appearance that we at once secured a specimen: it is still more commendable after use, not only for the bath but for friction. Made in variety: on the center of a long strap by which it may be applied round the body, and in several sizes with hand strap on the back, adapted to every convenience. The fibre is not subject to injury by hot water, hence it may even be boiled occasionally to sterelize it. "The Plumbly Cremating Furnace" (International Household Garbage and Cremating Co., 122 Franklin street, Buffalo), here shown and its use demonstrated on Pearl street every afternoon during the meeting, gained the commendation of every one who examined it. "Crystal Fountain, German-Proof Filters" (Geo. L. Squier Mfg. Co., Buffalo, N. Y.), worthily attracted the attention of visitors, as did also the exhibit of the Crystal Water Co. (Buffalo) to their aerated "pure water," "Crystal Lithia Water," "Carbonated Lithia Water," and "Specialties made from Crystal Water." "Sparkling Hudor Lithia Water" (The Hudor Company, Buffalo, N. Y.) was an evident favorite to the visitors, judging by the many who partook of it, as it has been to us for some time, and particularly during the past summer, while the Brooklyn drinking water was unfit to drink. "Sparkling Londonderry Lithia" (Londonderry Lithia Spring Water Co., Nashua, N. H.), also secured merited attention, as an excellent high charged lithia water, with which we have become acquainted from use. Surgical instruments, and other things useful in their way, but less attractive to sanitarians, were exhibited, for the particular notice of which we can not now spare the space.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

ALABAMA.—DR. W. H. SANDERS, of Mobile, has been elected State Health officer, to fill the vacancy occasioned by the death of Dr. Jerome Cochran.

The election of a successor to the late Dr. Cochran as Health Officer of the State, was lodged by law with the committee of Public Health of the State Medical Association.

Dr. Sanders was probably as close to Dr. Cochran as any other physician in the State and admires the methods of the deceased in looking after the public health. In every respect he is qualified to continue and promote the work so efficiently conducted by his predecessor. The official residence of the Health Officer will be as heretofore in Montgomery.

Mobile, 31,076: J. A. Abrahams, M. D., Health Officer, reports for August: Deaths, 96—22 under five years of age. From malarial fever, 8. Annual death rate, 22.80.

CALIFORNIA.—J. H. Davidson, M. D., President, Los Angeles; J. R. Laine, M. D., Secretary, Sacramento. The Secretary reports for August: Returns from 50 cities, towns, villages and sanitary districts, aggregating a population of 739,132, show a mortality of 865—a death-rate of 1.17 per thousand for the month, or 14.04 per thousand per annum. There were 129 deaths from consumption, 42 from pneumonia. 14 from bronchitis, 5 from congestion of the lungs, 4 from diarrhoea, 82 from cholera infantum, 36 from other diseases of the stomach and bowels, 10 from diphtheria and croup, 4 from whooping cough, 3 from malarial fever, 18 from typhoid fever, 8 from cerebro-spinal fever, 37 from cancer, 2 from erysipelas, 95 from heart diseases, 2 from alcoholism, and 426 from all other causes.

San Francisco, 330,000; Reports for August: Deaths, 454—121 under five years of age. From consumption 67, acute pulmonary diseases 47; from zymotic diseases, 39. Annual death rate, 16.44.

The Chinatown Rookeries. Sept. 9th, the Board of Health adopted the following resolution:

Resolved, That the Health Officer of San Francisco is hereby directed forthwith to remove and abate all nuisances which have been heretofore declared such by this Board and of which legal notice has been properly served, according to law, and the time to abate same by owner has expired.

Special Inspectors were at once sworn in and the demolition of the rookeries begun.

Los Angeles, 100,000; Reports for August: Deaths, 95—23 under five years of age. From consumption, 21; acute pulmonary diseases, 2; from zymotic diseases, 10. Annual death rate, 11.40.

COLORADO.—*Denver*, 150,000: William P. Munn, M. D., Health Commissioner, reports for August: Deaths 163, of which there were from cholera infantum, 32; typhoid fever, 170 cases reported, 13 deaths; diphtheria, 21 cases with 2 deaths; scarlet fever, 8 cases, 1 death; consumption, "contracted elsewhere," 24. Annual death rate 13.04.

In the opinion of the health department the quality of the water continued to be bad and it should be boiled before drinking.

The County Board of Health also reports for the month of August that an unusual amount of typhoid fever had been prevalent, especially in the western part of the country. Some cases have occurred in a number of *dairies* near Denver. Four cases were found at two dairies southeast of Sullivan and four at a ranch near Rose Hill.

CONNECTICUT.—Professor William H. Brewer, Ph. D., New Haven, President; Professor C. A. Lindsley, M. D., Secretary, New Haven.—The Secretary's bulletin for August comprises reports from 167 towns in the State, with an aggregate population of 854,360, from which the number of deaths reported for the month was 1,644. The death rate for the larger towns is 23.6; for the smaller, 21.6 and for the whole State, 23.0 Deaths from zymotic diseases, 555—33.7 per cent. of the total mortality—chiefly from diarrhoeal diseases 370, diphtheria 21, and typhoid fever 28.

Typhoid fever is particularly prevalent in New Haven, Sept. 5th: 122 cases thus far reported since about August 1st. During the week ending Sept. 12, 22 cases were reported.—Inspectors are at work getting all the information that they can concerning the source of supply of milk, vegetables, water, ice, etc. Nothing definite has yet been made known.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M. D., State Health Officer, Jacksonville.

A Good Plank.—The Democratic platform adopted at Ocala in June contains the following: "We heartily indorse the State Board of Health, and commend its efficient work, which, under the blessing of Divine Providence, has resulted in preserving the public health, and preventing the introduction and spread of epidemic diseases within the State since its organization, and has given confidence at home and abroad."—*Jacksonville Citizen.*

Jacksonville, 23,800.—Health Officer Douglass reports for July: Deaths 43, white 30, colored 13; 27 were under five years of age. Eight died of phthesis; 4 each of enterits and entero-colitis and 3 of malarial fever.

Pensacola, 15,000: A. Grant, Secretary, reports for August 21 deaths, of which 7 were of colored persons and 10 under five years of age. Annual death-rate, 16.8. Consumption caused 2 deaths and typhoid fever 1.

ILLINOIS.—William E. Quine, M. D., President, Chicago; J. W. Scott, Secretary, Springfield.

New rules of the State Board of Health which require the *Registration of Midwives* and *Report of Births* went into effect Sept. 7th. Hereafter every physician and midwife in the city will be required to promptly report all births, as is now the case with deaths.

No midwife will be permitted to attend under any circumstances a case of contagious disease. If she is called to attend a case of this kind her duty will be to call a regular physician and notify the Health Department officials at once.

Chicago, 1,619,226: William R. Kerr, Commissioner, reports for August: Deaths, 2,261—1,087 under five years of age. Death rate for the month, 1.40; for the year ending August 31, 14.96. Prevailing causes of death and the numbers: From diphtheria, 50; typhoid fever, 64; consumption, 194; pneumonia, 59; bronchitis, 42; whooping cough, 24; diarrhoeal diseases, 373.

Infant mortality appears to have greatly increased during the last twelve months; 3,000 more, Dr. Reilly is reported as having said, than it would have been with a pure water supply. In July and August of this year, Dr. Reilly asserts, the deaths among children under 5 years of age were, respectively, 55.2 per cent. and 48.1 per cent. of the total death rate. This high death rate among infants is more remarkable from the fact that a decided improvement in the milk supply is noticeable. Dr. Reilly concludes that all benefits expected from a pure milk supply avail nothing unless the water supply is kept equally pure. In view of these conclusions too much emphasis can not be laid on the appeal to housewives to boil the water used for drinking purposes, especially for children. This constitutes an added reason, too, for the School Board to place filters in the public school buildings.

An improved *ambulance* has been adopted by the Health Department, which is described as follows: It is provided with pneumatic tires and the body is supplied with the finest quality of springs. The driver's seat is five feet in front of the covered space occupied by the patient. On the floor, in a basket casing, is the resting place for the patient. It consists of a hair mattress, four inches thick,

covered with leather. A leather pillow and a roll of blankets are at the head of the couch.

Diphtheria in Philo.—It is reported, Sept. 9th, that there are eight cases of the disease there now among the children, and it is feared the number will increase in the next few days. The people of the town are making every possible effort to avert it, and as an extra precaution the public schools have been closed, to remain closed until there is an abatement of the disease.

INDIANA.—Douglass C. Ramsey, M. D., President, Mount Vernon; J. N. Hurty, M. D., Secretary, Indianapolis.

Indianapolis, Sept. 13.—The Secretary of the State Board of Health returned from Redkey yesterday, where he went to investigate the *diphtheria epidemic* raging there. The town has had thirty cases of diphtheria, ten of which have proved fatal. The Secretary succeeded in having a meeting with the Town Board and physicians, and a local health officer was selected and instructed as to the methods used to prevent the spread of the disease. Nothing had been done to prevent the spread of the disease, except to hang out cards. Public funerals followed the death of the victims and no attempt was made to quarantine the cases before death. The Secretary recommended that the opening of the public schools be deferred until after the disease had been controlled.

Secretary Hurty received telegrams yesterday from White, Orange and Vermillion counties saying the disease was spreading in those counties. It is also reported prevalent in Mentone, Eaton, Elkhart, Lost River township, East Chicago and Whiting.

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

Davenport, 31,484.—A. W. Cantwell, M. D., Physician; report for August: Number of deaths, 44—14 under five years of age. Death rate per thousand, 16.7. Zymotic diseases caused 7 deaths, and consumption, 4.

Diphtheria is reported prevalent in McGregor, Iowa Falls, and in the country five miles east of Fort Dodge, with great malignancy.

KENTUCKY.—Joseph M. Matthews, M. D., President, Louisville; J. N. McCormack, M. D., Secretary, Bowling Green.

Covington is reported as suffering with an epidemic of *diphtheria*, and meanwhile considerable difficulty in securing the services of

an efficient health officer. But on September 8th Dr. J. P. Riffe was elected health officer, and some hope was inspired among tht afflicted.

Lexington has been engaged for several months in a series of *experiments on water purification*, which include alum, permanganate of potassium, "gravity systems," and finally an electric process. A current of electricity of 30,000 volts pressure is being hurled through the water. The pumping station is about three and one-half miles northeast of Lexington, on the banks of the Ohio river, whence the water is obtained. The reservoirs are two miles from the station and about the same distance from the city itself. The daily consumption of the water is about 24,000,000 gallons. The experiments dealt with purification of 150,000 gallons. The experiments so far have been entirely satisfactory, apart from a mechanical difficulty connected with the imperfect insulation of the purification tanks, through which the water had to pass. This is a defect which in no way militates against the system as a whole.

The principle involved is this: By subjecting the water to a sufficiently powerful current, electrolysis results, this meaning the resolving of a portion of the water into its elements, hydrogen and oxygen. A portion of this freed oxygen assumed that molecular form which is commonly known as ozone. Now ozone is one of the most powerful disinfectants known to science. It exercises its beneficent powers by combining with harmful substances, thus oxidizing them and rendering them powerless for evil. Nine-tenths of the popular disinfectants owe their powers for good to this "oxidizing" process, which is dependent on the presence of free oxygen. The nitrogenous substances found in drinking water, and which are in the main responsible for disease and sickness, are tackled by this ozone and instantly rendered harmless. Animal refuse, decaying vegetable matter, sewage and the like, all come under the head of nitrogenous substances. The passage of the electric current also liberates a quantity of free oxygen, which is absorbed by the water and which renders the fluid sparkling and healthful. "Dead water," from which "free" oxygen has been expelled, not only cannot support such life as is found in water, but, in addition, is not fit for human consumption. It is for this reason that water that has been boiled and from which the oxygen has been expelled is flat and tasteless.

Another aspect of the system is this: Physicians are pretty well agreed that most forms of microbes and bacilli can be destroyed by a sufficiently powerful electric current. The microbes that can survive an intermittent shock of 30,000 volts must have remarkable organizations. Analysis of the treated water shows that practically no microbes pass through the ordeal. Subsequent to the first series of electric shocks to which the water is subjected, it runs the gauntlet of powerful electro-magnets which repel dia-

magnetic particles—metallic particles, alkalines, etc.—precipitating them to the bottom of the purifying tank. There is also a secondary electrolysis apparatus which gives the final quietus to such harmful matter as may have escaped the preliminary process.

The apparatus, in brief, is this: The water flows through a feed pipe into a porcelain-lined receiving tank three feet square. Poles from a Ruhmkorff coil enter this tank from opposite ends. There are ninety-seven miles of wire on the coil, by which, with the aid of a sufficiently powerful dynamo, 10,000 volts of electricity are intermittently discharged through this water. The water, through the medium of a discharge pipe, then enters a second vat, which is three feet in diameter by seven feet in depth. This last chamber is made of iron, lined with india rubber, and is pear-shaped. The lower end connects with a waste pipe, by means of which the refuse and other matter precipitated during the process may be drawn off. At the top of this chamber and also at its lower section is a series of wires connected with another dynamo, which supplies a continuous galvanic current, this giving the secondary electrolysis. On the top of the chamber is a large electro-magnet surrounded by a series of smaller ones. The water by pressure is forced past these magnets into a second vat or chamber similar to the one first named and again descends into another pear-shaped vat. The process is repeated in a third case, so that the water has to run the gauntlet of three preliminary chambers and pear vats. In all, therefore, it receives the discharge from three Ruhmkorff coils—30,000 volts—to say nothing of the treatment to which it is subjected in the secondary vats. An analysis of the water when it finally issues from its ordeal shows that it is practically chemically pure. It is crystalline in appearance, sparkles with free oxygen, and is absolutely free from odor or taste.

The process is held to be about one-third cheaper than any other purifying method now known. The only thing necessary to success is to see that the dynamos are kept in good running order and that the waste pipes are turned at stated intervals. According to the advocates of this system, the "gravity" or ordinary filtering process is nearly four times as expensive. It is said that the Lexington residents have decided to adopt the system, and that a revolution in the art of water purification is at hand. Some food, on the ground that many of the salts which are precipitated by the process described are the reverse of harmful and are indeed necessary for health, but these men, however, assert the contrary.

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. F. Patton, M. D., Secretary, New Orleans.

New Orleans, 275,000—80,000 colored: Deaths in August, 575—colored, 228—175 under five years of age—58 colored. Deaths from consumption, 81; pneumonia, 28; bronchitis, 11 *small-pox*,

2; cholera infantum, 10; enteritis, 12; insolation, 10: Death rates: Whites 20.84; colored, 34.20: 25.09.

Smallpox and *Vaccination*, 1895 and 1896:—In February, 1895, a man came here from Arkansas, and afterwards developed a well marked case of variola. At that time the disease existed all over the Eastern Arkansas and Western Tennessee counties. Otherwise than in a very general manner we could not further or more definitely trace the origin of the disease. From this case others in due season developed. In February, one; in March, four; April, three, and in May it reached the alarming proportion of 58 cases; in June there were 36 cases. After the first case in February, the authorities vaccinated all parties living in the infected localities, that is, all who would accept vaccination. The clothing, bedding and wearing apparel, except those worn by the patient when sick, and the bed upon which he slept, were subjected to boiling water for 30 minutes, and afterwards left over night in a bichloride solution of 1-1000. Those articles and fabric, coming in direct contact with the patient were destroyed by fire. All carpets and mattings in the patient's room were also destroyed by burning. The walls, floors, all furniture and fixtures, the galleries, and even walks, yards and outhouses, were sprayed or otherwise washed down with a bichloride solution of 1-1000. The interior of the house, after thoroughly closing the openings and chinking all cracks, was subjected to sulphur fumes for 9 hours, with from 5 to 7 pounds of sulphur candles to 1,000 cubic feet of air space. With these rigid measures observed in every instance of the disease, the outbreak was in a manner controlled during the summer months of 1895, but, with the advent of winter, the disease seemed to take a fresh start, having been re-introduced from time to time from the country parishes where it existed to quite an extent. In the fall of 1895, a very rigid vaccination campaign was inaugurated by the Board of Health, and the work was not stopped until the entire city had been canvassed by a large and efficient corps of physicians who systematically, by districts, went from house to house offering and urging free vaccination. During this campaign, 53,437 people were vaccinated and re-vaccinated. After this systematic vaccination campaign was over, and the influx of darkies from the country parishes had ceased, the disease steadily decreased. In March, 1896, we had the greatest number of cases of any month during its prevalence, reaching a total of 334 cases. Since the introduction

of the disease in February, 1895, we have had 1,126 cases with 291 deaths, making a death rate of 25.84-100 per cent.

This may seem a little high, but it is owing to the large percentage of negroes who contracted the disease having it with consumption, specific troubles, etc., bringing about a diminished vitality and ability of the patient to resist so severe a disease as small pox; further, very few of these negroes had been vaccinated, consequently they suffered from the most severe variety, in which, of course, the death rate is very high. The death rate among those with varioloid pure and simple was nil. At the present time we have not a single case of small pox in our city. To quote from the Chicago Health Report, "our outbreak of smallpox was the result of neglected vaccination," as was clearly proven by the satisfactory result of our systematic vaccination campaign, coupled with our very rigid measures of disinfection and quarantine. In vaccination, many obstacles had often to be overcome: ignorance, suspicion and superstition is still very rank among many of our population, and in the absence of any law compelling submission to vaccination, we were often refused. In my opinion this is the chief reason why the disease prevailed so long. One of the most urgent health considerations at the present time is a law compelling vaccination of all parties at the discretion of the health authorities.

One other matter of important consideration during smallpox outbreaks is the period of convalescence and the time of discharge of the patient. All quarantine regulations, disinfection and fumigation amount to naught if the patient is discharged too early, or before desquamation is complete. Great care should be exercised in the examination of the head, hands and feet. All dark places, especially on the hands and feet, should be carefully picked out, and the parts soaked well in a bichloride solution 1-1000. The hair of the head should be shaved off, and before dismissal, the patient, in the presence of a sanitary officer or other authorized attendant, should be made to wash down first in a hot salt water bath, and then be dashed with a bichloride solution of 1-1000. After this rigid treatment, they are allowed to don uninfected garments, and to mingle again with people of the outside world.

With the rigid enforcement of vaccination, and the above mentioned quarantine and disinfection methods, we could safely relegate variola to the diseases of history. The remedy is at hand; give us the legal right to apply it.

MAINE.—C. D. Smith, M. D., President, Portland; A. G. Young, M. D., Secretary, Augusta.

MARYLAND.—John Morris, M. D., President, Baltimore; James A. Steuart, M. D., Secretary, Baltimore.

Baltimore Herald, Sept. 8th: A somewhat stormy meeting of the State Board of Health was held to-day, at the conclusion of which Dr. Steuart offered his resignation, which was accepted, to take effect the second Thursday in October. He said that he resigned in the interests of harmony, but he was still convinced that he was in the right, in the subject of contention. Dr. John S. Fulton was elected to fill the vacancy.

Baltimore, 506,398—75,344 colored. James F. McShane, M. D., Health Commissioner, reports for August: Deaths, 922; 741 white persons, and 181 colored. Death rates: Whites, 20.65; colored, 29.97; 21.86; 401 were children under five years of age. Deaths from consumption, 76; pneumonia, 19; cholera infantum, 118; typhoid fever, 9; insolation, 100; infectious cases, 159.

MASSACHUSETTS. — H. P. Walcott, M. D., Chairman, Cambridge; S. W. Abbott, M. D., Secretary, Boston.

Boston, 501,083; S. H. Durgin, M. D., Chairman. Deaths in July, 1,282—689 under five years of age. Annual death rate, 30.70 per 1,000. From diphtheria, 36; scarlatina, 8; consumption, 121; accident, 62. Cases of contagious diseases reported for the month: Diphtheria, 300; measles, 230; scarlatina, 72; typhoid fever, 56.

Cambridge.—The typhoid fever epidemic appears to have been traced (*Boston Post*, Aug. 26), to the case of a boy employed by a milkman. This milkman supplied a large number of families, and the disease was reported among the consumers of the milk furnished by him. The authorities compelled the milkman to dispense with the services of the boy. It was decided that the disease was spread by him. Two men, also employed by the milkman, were also found to be suffering from the disease and were sent away.

The physicians' report stated that the sanitary condition of the dairy was first-class and that no source could be found from which the disease could have been contracted. Out of the eighty cases reported there have been but five deaths, the patients having the disease in a very mild form in the majority of cases.

Diphtheria is reported prevalent in Milford, Medford and Pittsfield

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

The Secretary reports: For the month of August, 1896, compared with the preceding month, typhoid fever, cholera infantum, dysentery, cholera morbus, erysipelas and remittent fever increased in area of prevalence. Compared with the average for August in the 10 years, 1886-1895, typhoid fever was much more than usually prevalent and intermittent fever, consumption, remittent fever and inflammation of bowels were less than usually prevalent. Including reports by regular observers and others, *consumption* was reported present in Michigan in the month of August, 1896, at 217 places; *typhoid fever* at 100 places; *scarlet fever* at 34 places; *diphtheria* at 34 places; *whooping-cough* at 27 places and *measles* at 25 places.

Reports from all sources show *consumption* reported at 4 places more; *typhoid fever* at 18 places more; *scarlet fever* at 10 places less; *diphtheria* at 7 places more; *whooping-cough* at 13 places less and *measles* at 40 places less in the month of August, 1896, than in the preceding month.

A Demand for Better Vital Statistics.—At a Conference of Health Officers of Michigan, held in Ann Arbor on July 16th and 17th, action was taken looking toward the improvement of the methods of registration of vital statistics in this state. A committee was appointed, which drafted the following resolution for presentation to the next legislature:

Whereas, Reliable statistics constitute so important a basis for the development of the sanitary service of the state, and the methods of collecting these statistics in this state are such that gross errors may be made, therefore we, members of the Conference of Health Officers of the State of Michigan, petition the coming legislature to pass a law for the immediate registration of births and deaths.

MINNESOTA.—Franklin Staples, M. D., President, Winona; C. N. Hewitt, M. D., Secretary, Red Wing.

St. Paul, 215,000: Alexander J. Stone, M. D., Commissioner, reports for August: Deaths, 127—47 under five years of age. Annual death rate per 1,000 was 7.09. Deaths from diphtheria, 3; consumption, 14; cholera infantum, 8.

Minneapolis, 225,602: H. N. Avery, M. D., Commissioner, reports for August: Deaths, 187—78 under five years of age. Deaths from diphtheria, 6; cholera infantum, 18; consumption, 19; typhoid fever, 7. Death rate for the year ending August 31st, 9.02.

MISSOURI.—F. J. Lutz, M. D., President, St. Louis; Willis P. King, M. D., Secretary, St. Louis.

St. Louis, 570,000—31,000 colored: M. C. Starkloff, M. D., Commissioner of Health, reports for August: Deaths, 1,015—319 under five years of age. From diphtheria, 8; phthisis, 75; typhoid fever, 29; pneumonia, 19; bronchitis, 12; diarrhoeal diseases, 98; insolation, 132. Annual death rate per 1,000, 35.2.

Laundries and Second-Hand Clothing. — The St. Louis Board of Health has taken the initiative against a well-recognized danger in the dissemination of infectious diseases. At a recent meeting of the Board the following resolution was adopted:

Whereas, We have reached a period in the progress of medical and sanitary science where it is incontestably demonstrable that consumption is a communicable disease, through the contagia of tubercle bacilli carried in the sputa, in handkerchiefs and clothing; therefore, be it

Resolved by this Board, That the public be duly notified through the Health Commissioner of the importance of proper precautions against the spread of this disease, that they may patronize only such laundries as properly disinfect their rinsing water, and that the chief sanitary officer, with his assistants, be instructed to advise all public laundries of the necessity of proper disinfection of soiled clothing, and of effective methods of accomplishing the same, to the end that the spread of phthisis pulmonalis may thereby be restricted and the health of washer men and women and other laundry employes may be better protected from this insidious scourge.

Resolved further, That the Health Commissioner, this Board concurring, be advised to take prompt steps by detailed service, ordinance or otherwise, to secure immunity to individuals and public institutions from the needless ravages of consumption, through sanitary laundry precautions and Health Board regulations.

Resolved, That the legislative authorities be hereby informed that, in view of the above facts, some precautionary legislation is required in regard to the disposal of second-hand clothing and books, and that the Health Commissioner is hereby requested by this Board to take proper steps in the direction of proper sanitary precautions with the second-hand clothing and book men of the city by recommending suitable legislation on the subject.

Kansas City, 150,000: E. Von Quast, M. D., Health Officer, reports for August: Deaths, 145—50 under five years of age. Annual death rate per 1,000, 10.54. Deaths from diphtheria, 6; consumption, 11; cholera infantum, 6 typhoid fever, 5.

MONTANA. *Butte City*, Sept. 13: *Diphtheria* has been prevalent, but now abating somewhat. One week ago there were probably 20 cases in the city. Now there are not to exceed seven or eight cases.

NEBRASKA.—J. V. Beghtol, M. D., President, Friend; F. D. Haldeman, M. D., Secretary, Ord.

Grand Island, August 19.—*Diphtheria* is raging to such an extent at *Broken Bow* that even the Sunday schools, as well as all other places where children congregate, have been closed until the scourge abates.

Nebraska City is also reported, September 9, to have an epidemic of *diphtheria*—attributed to foul local conditions consequent upon defective sewerage.

NEW HAMPSHIRE.—G. P. Conn, M. D., President, Concord; Irving A. Watson, M. D., Secretary, Concord.

Bristol (Boston *Journal*, September 11,) is agitated over the prevalence of *typhoid fever* to such an extent as to threaten an epidemic.

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

Hudson County.—Jersey City and vicinity, 338,671.—The Street and Water Board of Jersey City held a special meeting August 24th for the reception of bids for a new water supply. Three proposals were handed in, but one, to furnish water by filtration, was informal. It was submitted by the United States Filtering and Purifying Company. The other bids were from the East Jersey Water Company and the Rockaway and Hudson Company.

After the bids had been read, the Rockaway and Hudson Company entered a protest against the bids of the East Jersey Company on the ground that its bids only contemplated one pipe. Coupled with the offers to supply, were offers to sell the plants to the city. The Board took the bids and went into executive session, and two hours later adjourned without having taken action.

Newark, 215,725: Health Officer Chandler reports for the two weeks ending August 22. Deaths, 326—147 under five years of

age; from diphtheria, 9; consumption, 15; pneumonia, 7; diarrhoeal diseases, 67; insolation, 67. Annual death rate, 34.22.

Paterson, 103,020: J. L. Leal, M. D., Health Officer, reports for August: Deaths, 224—120 under five years of age; from diphtheria, 9; consumption, 17; pneumonia, 6; diarrhoeal diseases, 62. Annual death rate, 21.61 per 1,000.

Typhoid fever is reported prevalent in Elizabeth and Passaic.

Diphtheria is reported prevalent in Pompton Toweship, Bayonne, Camden, Stockton, and Orange.—The right of the Health Officer of Orange to close the schools to prevent the spread of diphtheria is challenged by the Board of Education on the ground that the Health Officer has no power to close the schools, and that this must be done, if at all, by a majority vote of the entire Board of Health, however difficult to assemble, even though meanwhile many lives may be jeopardized.

NEW YORK.—Daniel Lewis, M. D., President, New York; B. T. Smelzer, M. D., Secretary, Albany.

The Secretary's *Bulletin* for July reports 12,659 deaths—3,300 more than for the preceding month, and 1,000 in excess of that of the corresponding month of last year, as well as that of the past ten years. Compared with the preceding month there were 2,200 more deaths from *Diarrhoeal diseases*, 500 more from diseases reported as of the *Digestive organs* and 200 more from diseases of the *Nervous system*; there were also about 100 more deaths as the result of accidents and violence. Compared with the reported mortality of July, 1895, the increase is limited to deaths from local diseases and to accidents and violence, from which there were also about 100 more deaths, largely from drowning. The same is true respecting the comparison with the average mortality for this month. July is always the month of largest mortality on account of the increase in *Diarrhoeal diseases*, more than ten per cent of the year's mortality occurring in this month. Of the total mortality this month nearly one-fourth were from this cause, which is below the average; the relative proportion was largest in the Lake Ontario and Western district, causing 31.5 per cent of the deaths, and least in the West Central, 12.9 per cent. The *infant mortality* constituted 49.0 per cent of the deaths, the ordinary ratio for the month being from 50.0 to 54.0 per cent. The proportion of deaths from all Zymotic diseases was below the average, being about 30.0 per cent, against from 32.0 to 40.0. There was a moderate increase in

the deaths from *Typhoid fever* and *Whooping cough.* The mean average temperature for July of 71.0 degrees prevailed with an excess of rainfall of 1.30 inches, the prevailing winds being southwesterly.

New York City, 1,995,000.—Report for July: Deaths, 4,214—2,296 under five years. Death rate, 24.85. Zymotic diseases, per 1,000, from all causes, 305.00; diphtheria, 126; typhoid fever, 25; consumption, 364; acute respiratory diseases, 357; diarrhoeal diseases, 973.

Brooklyn, 1,100,000.—Report for July: Deaths, 2,542—1,510 under five years. Death rate, 27.60. From zymotic diseases, per 1,000, from all causes, 343.50; diphtheria, 94; typhoid fever, 13; consumption, 179; acute respiratory diseases, 36; diarrhoeal diseases, 691.

Buffalo, 335,709.—Report for July: Deaths, 542—317 under five years. Death rate, 18.58 From zymotic diseases, per 1,000 deaths, from all causes, 446.50; diphtheria, 7; acute respiratory diseases, 42; consumption, 34; diarrhoeal diseases, 218.

Rochester, 160,000.—For July: Deaths, 262—126 under five years. Death rate, 19.30. From zymotic diseases, per 1,000 deaths, from all causes, 340.00; consumption, 27; acute respiratory diseases, 10.

Albany, 100,000.—Report for July: Deaths, 87—70 under five years. Death rate, 22.00. From zymotic diseases, per 1,000 deaths, from all causes, 305; typhoid fever, 6.

Syracuse, 100,000.—Report for July: Deaths, 196—77 under five years. Death rate, 23.52. From zymotic diseases, per 1,000 deaths, from all causes, 320; consumption, 5; acute lung diseases, 11.

North Carolina.—George G. Thomas, M. D., President, Salem; Richard H. Lewis, M. D., Secretary, Raleigh.

August bulletin summarizes reports from 26 towns, with aggregate populations of 84,272 white and 60,463 colored, for the month of July: Deaths, 111 white, 146 colored. Death rates respectively, 15.8, 28.9; 21.3. The chief causes in the order of their greater numbers were: From diarrhoeal diseases, 59; consumption, 30; typhoid fever, 24; malarial fever, 17; whooping cough, 9; pneumonia, 7; from other causes, 1 to 4.

Ohio.—S. P. Wise, M. D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus.

Cincinnati, 350,000: J. W. Prendergast, M. D., Health Officer,

reports for August: Deaths, 376—146 under five years of age. Death rate, 13.46 per 1,000. From diphtheria, 8; typhoid fever, 14; consumption, 62; pneumonia, 15; diarrhoeal diseases, 26.

Cleveland, 330,279: J. L. Hess, M. D., Health Officer, reports for August: Deaths, 425—204 under five years; from diphtheria, 10; typhoid fever, 15; consumption, 20; pneumonia, 22; diarrhoeal diseases, 72. Death rate, 14.69.

Toledo, 137,780: J. T. Woods, M. D., Health Officer, reports for August: Deaths, 168—81 under five years of age. Annual death rate, 14.6 per 1,000. From diphtheria, 1; typhoid fever, 6; consumption, 11; diarrhoeal diseases, 22.

Diphtheria is reported prevalent in Eaton, Portsmouth, Lockland, Fletcher, Williamsport, Jackson, Mt. Sterling and Ironton.

PENNSLYVANIA.—Pemberton Dudley, M. D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

Philadelphia, 1,188,793: Theodore B. Stulb, Health Officer, reports for five weeks ending August 29: 2,599—1,129 under five years of age. Deaths from diphtheria, 49; typhoid fever, 44; consumption, 197; pneumonia, 74; diarrhoeal diseases, 442; insolation, 222.

Purification of the water supply continues to be the most urgent question before the Board. *A new source* is also urged by the Philadelphia Water Supply Co., namely, the Delaware River. The matter is now in the hands of the City Councils, awaiting report.

Municipal Hospital for Consumptives has been proposed and urged by Dr. W. H. Ford, President of the Board, by a resolution to that effect, on which he said: "The fact that consumption is well known to be an infective disease, whose spread may be limited by the adoption of certain precautionary measures, and further, that the disease is annually destroying thousands of lives, many of which are sacrificed to ignorance, neglect and want, imposes upon the municipality a grave duty from which there is no escape. As yet no effort has been made to meet this responsibility at all commensurate with its gravity. What has been done is largely at the instance and by the efforts of philanthropic societies, and principally in the way of establishing hospitals for the sick, which is of supreme importance. This subject has aroused the sympathies of the philanthropist and enlisted the most serious consideration of the sanitarian, for, if any progress is to be made in staying the ravages of consumption, isolation and treatment in hospitals must be depended on as a most important means of attaining this end. The

municipality is obliged to provide for the indigent sick, but especially urgent is this demand when such sick persons, unprovided for, jeopardize the public health."

Pittsburg, 280,000; Report for the five weeks ending August 29: Deaths, 483—250 under five years of age; typhoid fever, 15; consumption, 25. Death rate, 17.9.

An investigation of the *dairies* with reference to the increased prevalence of *typhoid fever* has revealed (Dispatch, Sept. 10th) some horrible conditions. The officers were so disgusted at the condition that they were prompted to enter suit at once. The question of fairness alone prevented this. The first dairy visited was that of Mrs. Frederick Kohler. Six cows had been housed in a very filthy pen, with a horse and pony. The stable seemed large enough for but four animals of any kind. The offal was piled high in disease breeding, foul smelling heaps, and the quarters of the cows were covered with the filth of the stable. The pen was dark and illy ventilated. The cows were turned into a lot nearby, almost entirely devoid of vegetation, and this was the only pasturage they had. The milk cans hung on the fence in anything but a clean condition. Several others are cited, as bad. That typhoid fever should be prevalent thereabouts is eminently fitting.

Typhoid fever is also prevalent in Shamokin and the Navy Yard, *League Island*. Surgeon Siegfried of the battle ship Massachusetts reported that on August 31 he had been compelled to transfer from the ship to the Brooklyn hospital the fifth case of typhoid fever since that vessel was commissioned at League Island on June 10 last. The battleship Indiana, also fitted out at League Island, has had sixteen cases of typhoid develop aboard.

One of the Massachusetts men died shortly after the vessel left the yard. The surgeon attributes the disease to the bad drainage of Philadelphia and the condition of that part of the city nearest League Island, and recommends that no ships be commissioned or fitted there until the conditions are changed.

Surgeon-General Tryon, in his endorsement on the report, corroborates the statements, and adds that the four cases of typhoid which developed this summer on the Bancroft were directly traceable to the Schuylkill water supply. It is said at the Navy Department that the Dolphin invariably develops cases of malaria after leaving the Washington yard, which is at a focus of sewers.

Diphtheria is reported prevalent in Bethlehem, Uniontown, Berlin and Lamont.

RHODE ISLAND.—A. G. Sprague, M. D., President, River Point; Gardner T. Swarts, M. D., Secretary, Providence.

Providence, Aug. 21: "Six cases of *typhoid* and *malaria* in one family." There is a strange condition of things where the typhoid patients are. What should have been a back yard is occupied with two smaller tenement houses. There are three outbuildings. In one there are stalls for five horses, in another stalls for two, and the third is a hen house. There are no modern conveniences except a Pawtuxet water faucet in the house. Three out-houses stand right under the windows of the sleeping rooms where the sick ones are tossing uneasily on their beds.

In this quarter there has been sickness of the same character in three families since July 1. In the whole city there have been 23 cases in the same period according to the chart in Dr. Chapin's office at the Health Department. The Health authorities say that what might have been expected happened in this family. In other words, the disease spread. On that expectation, what might have been expected didn't happen—the destruction of the conditions forthwith on their discovery.

Newport, Aug. 2: Annual meeting of the Sanitary Protection Association. Mr. J. J. Van Allen, President, said:

During the past twelve months, as for the past eighteen years, the association has held itself ready to assist the community in preventing the varied forms of illness, the causes of which are removable. Thanks to the local Board of Health, the city is now kept in a tolerably satisfactory condition. The public water supply, while not yet perfect, fairly meets our needs, and yet I have to recommend to our members careful filtration of the drinking water, either by the "Pasteur" or the "Natural Stone" methods, and, in addition, during the summer weather, that it should be boiled, this being the advice of the physicians who have most closely investigated bacilli and their injurious effects. There are still too many persons, not all of them of the poorer class, who do not avail themselves of the city water, and therefore run the risk of using polluted wells, or, if depending upon a neighbor's supply, use far less water in their household than is required either by health or decency. * *

Our streets have been kept fairly clean, and yet there is room for improvement.

Public urinals should also be provided, in view of the great number of strangers and excursionists who visit the city. Advance in some respects has been made in the care of the sewers, and yet in

others retrogression. To understand what I mean, one has but to examine the present overflow of the old main sewer at Long wharf, with its fetid discharges very near to Thames street, and to look at the side of the stone yard office next adjoining, which is blackened by the constant escape in great volumes of offensive sewer gas. Do we wonder that yachtmen are inclined to abandon Newport as a stopping place?

The Board of Health has forbidden the construction of further privy vaults and cesspools, and yet there are a great many still in use, and others that, though unemployed, remain unemptied.

An inspector of plumbing has been appointed, a great advance. New buildings have been ordered connected with the sewers, under official supervision. Though the perfecting of the sewerage system has resulted, as was expected, in lowering the level of the general ground water and thereby drying many cellars which had previously been the cause of much illness, there are a large number that still remain too damp for health, if not always absolutely wet, than which there is no surer source of predisposition or aggravation of both rheumatism and consumption. Every cellar in the city should have a floor of cement or asphalt.

The collection of ashes has been improved by covers to the carts, which prevent the loss of material already collected and the escape of the fine dust so irritating to the eyes. So much cannot be said of the gathering of the swill or garbage. The wagons leak in transit; these visits are made during the day, when windows are open and the public is upon the streets, instead of at earlier hours. The whole system of throwing the collected filth and putrid matter into the sea cannot be too strongly condemned. * * *

Although matters appertaining to the public health may thus, to a great extent be satisfactorily summarized, the especial work of the association upon private premises remains to be done. The sewers, inside drains and plumbing of the houses of its members are liable at any moment to require examination and repair, and this last again frequently requires skilled supervision. * * *

Amid all the minutiae of household sanitation, there is an extremely important feature that has been generally lost sight of. Foul smells are at once noticed, the trickling from leaking pipes is heard, discoloration of walls and ceilings is seen. Where these are absent, mere closeness or even mustiness of halls or sleeping rooms too often fail to attract attention. Perfect circulation of pure air through a house, and the entrance where possible of sunlight, are

as necessary as good food. In constructing a dwelling these are sometimes lost sight of, or where considered, they may become prevented by subsequent changes or additions.

SOUTH CAROLINA.—*Charleston*, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M. D., Health Officer, reports for five weeks ending August 29th: Deaths, 177—134 colored. Under five years of age, 62. Annual death rates—white, 15.44; colored, 37.24; 27.60.

Annual report for 1895: There were 1,837 deaths, 540 of whom were whites, 1,297 black and colored. The total number of deaths is lower than the average for ten years. Deaths from typhoid fever, 33—18 among the whites and 15 among the colored; from diphtheria, 4—3 white and one colored; from scarlet fever, 2—both among the whites; from diarrhoeal diseases, 306—white 73, colored 233; from consumption, 233—39 white, 194 colored. Death rates: White, 18.70; colored, 29.10; 28.18.

The Quarantine Service of the port of Charleston has been as carefully and as faithfully carried out as has been done for a number of years past. The station is in first-class condition, and is ready to fulfil its mission and purpose in the best possible way for the benefit of the port, reducing the detention to the least possible time and giving thorough safety from dangerous diseases. Dr. Lebby and the employes of the station have been faithful and efficient in performing their duties.

TENNESSEE.—J. D. Plunkett, M. D., President, Nashville; J. Berrien Lindsley, M. D., Secretary, Nashville.

The Secretary's Bulletin reports:

The principal diseases, named in the order of their greater prevalence, in the State, for the month of July, were: Malarial fever, typhoid fever, dysentery, diarrhoea, whooping cough, consumption, lung diseases acute, scarlet fever, cholera infantum, diphtheria, measles, cholera morbus, meningitis and smallpox.

Object Lessons in Sanitation.—One of the most interesting features of the "Tennessee Centennial and International Exposition," which will open at Nashville in May next, will be "Hygiene, Sanitary Devices and Appliances." It is under the special direction of J. D. Plunkett, M.D., President of the State Board of Health, aided by an efficient committee, and will doubtless be the most comprehensive and at the same time select exhibits of sanitary mechanics, prepared foods, wearing apparel, apparatus for physical culture—in

short—of everything that is useful in the promotion of health, that has ever been made in this country.

There are also to be two laboratories in working order, one for bacteriology, the other for chemistry. The former proposes to be a model for such as should be attached to every municipal health department, and the latter for the examination of food, water, milk, &c., showing methods for detection and the exhibition of various adulterants used in the sophistication of foods. Perhaps the most startling and interesting collection of specimens will be that of cultures of bacteria. To the women and young persons who have never seen a culture of the infinitesimals of which we hear so much these days, and of which we should know a great deal more, this object lesson will be of great value.

UTAH.—*Salt Lake City*, 48,076: W. T. Dalby, M. D., Health Commissioner, reports for August: Deaths, 71; death rate, 12.17.

VERMONT.—C. S. Caverly, M. D., President, Rutland; J. H. Hamilton, M. D., Secretary, Richford.

WASHINGTON. — *Seattle* (Post-Intelligencer), Sept. 3: The proposed retrenchment by the City Council has caused a cold wave to strike the Health Department, which has been working three years to get another inspector, so that the work of the department in that line could be of benefit to the community. At present the force of the Health Department consists of four men, whose aggregate salaries for the month of August amount to $260. It is evident that, according to the City Council's estimate, health and life is of very little account in Seattle.

WEST VIRGINIA.—*Diphtheria* is reported prevalent in Wellsburg, Parkersburg and Moundsville.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; U. O. B. Wingate, M. D., Secretary, Milwaukee.

Milwaukee, 255,000: Walter Kempster, M. D., Commissioner of Health.

Total mortality during August, 416, of which 247 were under five years of age. Annual death rate, 19.20 per 1,000. Diphtheria caused 14 deaths; typhoid fever, 4; diarrhoeal diseases, 97; consumption, 21.

CANADA.—*Montreal*, Sept. 1: The statistics of the Provincial Board of Health for the month of August show that the public heath of the province is good. The returns from twenty-three counties are as follows: Quebec—13 diphtheria, 2 scarlet fever, 7 typhoid; Argenteuil, 1 diphtheria; Athabaska, 1 scarlet fever; Beauharnois, 4 whooping cough; Chateauguay, 2 measles; Cham-

bly, 4 whooping cough; Compton, 1 measles, 1 whooping cough; Hochelaga, 4 typhoid, 1 diphtheria, 1 scarlet fever, 1 measles; Huntingdon, 1 diphtheria, 2 typhoid; Joliette, 1 typhoid; Kamouraska, 1 diphtheria; Laprairie, 1 diphtheria; Megantic, 2 typhoid; Missisquoi, 2 typhoid; Montcalm, 7 measles; Montmagny, 7 whooping cough; Montmorency, 1 typhoid; Ottawa, 4 scarlet fever, 4 measles, 15 whooping cough; Portneuf, 1 typhoid; Rimouski, 1 typhoid; Sculanges, 1 typhoid; St. Johns, 1 typhoid.

CUBA.—*Yellow fever*, according to the most recent reports, is of increasing prevalence and malignancy. Official report of the Spanish army sanitary corps for the second ten days of July shows that there were in the military hospitals of Cuba at the end of that period 8,838 cases, 5,538 of which were new, and that 346 deaths occurred, 250 being due to yellow fever. Since that date the number of cases is said to have largely increased, but the exact figures cannot be ascertained.

CONTEMPORARY LITERATURE.

SOCIETY.—If a man chooses to be a sot, a hog, a savage, it is the bounden duty of his fellow men to bring the whole pressure of society to bear on him; of '*society*,' we say, not necessarily of *law*; that is a question for experts or statesmen, that 'part of conduct' concerns the individual merely and does not concern others? No part whatever. 'Conduct' is *ex hypothesi* a social act. No man's life is, or can be solitary. The whole of 'conduct' concerns society, concerns others; for human life simply means a continual action upon, and reaction from our fellow beings. 'We are all members one of another,' said the greatest of religious teachers, and the strength of all religions has lain in their bringing home to the believer the continuous and inevitable relation of every act and thought of the individual soul to the power which he believes to represent the sum of things and men around him. Nor can any Gospel look to supercede the old gospels of theology, unless it will base itself on the organic unity of the individual and of Humanity, and discard vain dreams about the isolated autonomy of the *auto-man*. Frederick Harrison on "John Stuart Mill," *Nineteenth Century for September*.

THE LIFE-CAR.—The first one built saved 200 lives from a single ship. Joseph Francis had been planning for several years for a life-car, a closed vessel or covered boat, which could be sent out to a stranded vessel on a rope and pulled back and forth. It was to carry two or three people. He could not see his way clear to make this of wood; but now the iron problem was solved, he could carry out all his plans.

The car was built according to the plan made by him, an inclosed, torpedo-like affair, and along in the terrible winter of 1849-50, it

was placed in the care of some untrained fishermen on the New Jersey coast, at Squan Beach. An English ship, the "Ayrshire," was wrecked here, one day, in the midst of a blinding storm. The men on the beach could do nothing with their ordinary boats. The life-car was brought out. A small cannon, or mortar, was loaded with a piece of smooth iron, several inches long, attached to a pile of cord. This was shot out over the spars of the ship. The people on board hauled in the cord and drew along through the surf a stronger rope. This was fastened to the mast and the life-car was swung from the beach, with the rope running through the two rings at each end, and pulled out to the vessel.

There were 201 people on board, and all but one of the number were saved.

The story of this rescue went round the world. All that had been said in praise of the inventor's powers was now justified. All Europe was interested. He was recognized by the nations of the world as one who had done a marvelous work for humanity—who had, as some one said, robbed the ocean-voyage of its terrors.

The making of these boats followed, but the original boat Mr. Francis preserved. Its home is now in the National Museum at Washington. It has been sent to many places for exhibition, to London among others, and it was an interesting feature of the Life-Saving Exhibit of the government at the World's Fair.—"Joseph Francis," by W. S. Harwood, in September *St. Nicholas.*

Is PERSONALITY FADING?—Is there already a reaction against our severely intellectual view of life? One story whose lyric style caught something of the throbbing of pure emotion has been eagerly devoured by a hungry generation. In *Trilby* there are men and women human to the touch. Hall Caine dares cope with human passion. But the spectacular emotions of his heroes have in them something too remote to win our sympathy. We cannot all have platforms on which to pass the crises of our lives. Meredith still preaches his gospel that life is greater than any one idea of life. But at times the eagerness of the preacher weakens the message. His people, though not incarnate notions, are too often incarnate impulses.

If it were not for these signs of change one could almost think that in real life too, not fction only, personality is fading into the abstract. It is possible that these impalpable heroes and heroines represent an actual loosening of grip on reality on the part of people supposed to be alive.

"There aren't any real women in the world any longer," said a clever critic the other day. "They are just ideas. You might fall in love with a half dozen of them and not know it."

The remark carries with it a warning to a generation more interested in questions about life than in living.—From the "Point of View," in September *Scribner's.*

THE HARD LIFE OF AN AFRICAN BABY.—I note at Chikwa's that the little baby strapped to his mother's back has a rough-and-tum-

ble time of it, but takes it all good-naturedly, and one hears very little crying in the village. The mother goes to the fields with baby on her back, bobs about for hours in the hot sun, weeding, hoeing, and doing general gardening; carries huge jars of water on her head; scrapes him repeatedly as she bends and enters the narrow, low doorways of native huts; gives him a thorough shaking as she vigorously pounds corn with a long wooden pestle; takes him by the wrist, ducks him in the stream till he is nearly suffocated, and then spreads him on a mat to dry.—("Glave's Journey to the Livingstone Tree," by the late E. J. Glave, in the September *Century*.

SPAIN'S UGLY MOOD.—The campaign has been so engrossing that questions of foreign policy and matters of Old-World news have been for a few weeks almost ignored by the American press. But for the warmth of home politics much discussion would have resulted from the report that Spain is deliberately and carefully preparing to make an appeal to all the governments of Europe for moral support as against the United States in the controversy concerning Cuba. The Spanish soldiers have had a frightful summer in the distressed island, owing to the excessive heat and the ravages of disease. Little news of fighting has been received, and there is no reason to think that Spain is making any headway toward the suppression of the rebellion. The Spanish government is making the most strenuous efforts to increase the strength of the Spanish navy with reference to a possible conflict with the United States. Our presidential election may be followed by the outbreak of very serious troubles between our government and that of the stubborn and bitter Spaniards. The prospect is serious.—From "The Progress of the World," in September *Review of Reviews*.

CLASS-ROOM HUMOR.—No professor is more kindly remembered by the "boys" who graduated from Wesleyan University a generation ago than Professor Johnston, or "Uncle Johnnie," as he was more familiarly known. Besides having a profound scientific mind far in advance of his time, he had a keen relish for a good joke, whether on himself or another.

In order to aid the students of geology in grasping the essential distinctions between the various classes of rock, he requested them to bring in specimens and place them on his desk before the recitation began.

One day a student brought in a piece of brick, secured from a building being erected near the college, and placed it on the table among the other specimens. "Uncle Johnnie" came in a few moments later, and, apparently unsuspecting the hoax, began the recitation as usual by picking up the specimens, one at a time, naming them, and remarking their peculiarities.

"This, gentlemen, is a piece of sandstone; this is granite; while this, somewhat similar in its formation, is quartz. And this," taking up the last bit on the table and gravely surveying the expectant class over the rim of his glasses, "is a piece of impudence."—From the "Editor's Drawer" of *Harper's Magazine* for September.

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CHANGE OF AIR—THE SCIENCE OF IT.

BY LOUIS ROBINSON, M. D.

Although "change of air" is one of the most generally recognized means of restoring lost health, very little is known as to the reasons why a temporary removal to a new district is frequently of such great benefit to invalids.

That progress has been made on the practical—as distinct from the purely scientific—side of the subject is made plain by the fact that most of the views and customs prevalent among physicians a hundred years ago have now been almost entirely discarded. Better methods of observation and a more exact habit of recording results of treatment—if not more enlightened theories on the physiological effects of change of air—have enabled us to take several considerable steps in the right direction. It seems odd enough to us in the present day that our great-great-grandfathers and their physicians considered sea-air to be peculiarly unwholesome, and spoke warningly of its dampness and chilling effects. The air of mountainous regions was looked upon as raw and trying for delicate lungs. In the olden time dwellings were scarcely ever built on an eminence except for purposes of defence, the more favorite sites being those in sheltered valleys. Most of our ancient mansions and farmhouses occupy damp and low-lying positions, such as no sane modern house-builder would think of selecting. English literature tells the same story. From the time of Elizabeth to that of George the Third we find "fruitful vales" and "shady nooks" continually spoken of as the ideal places for human dwellings. Up to the time of the present generation consumptives were ordered to warm and damp regions such as the West Indies or Madeira, because it was

thought that phthisis, "the English disease," resulted directly from the harshness of our climate. A very favorite last resort of the eighteenth century physician was to send a patient to visit the place of his birth, since it was thought that "natal air" would be likely to prove peculiarly beneficial. This last theory, although somewhat ludicrous when viewed from our modern standpoint, strikes us as being something more than a mere piece of plausible empiricism. It shows that, in spite of their terrible faith in physic, the doctors of those days did not lose sight of the importance of conforming to Nature's programme.

CLEAN SEA AND MOUNTAIN AIR.

Although the beneficial effect of sea voyages was to some extent recognized, it is easy to understand that the ships of the seventeenth and eighteenth centuries, damp and stuffy below, and provisioned with salt junk and hard biscuits, scarcely gave a broken-down invalid a fair chance of deriving any great amount of good from a change of air taken under such conditions.

Generally speaking, we now consider that sea and mountain air owes its virtue to its freedom from organic impurities. Probably it is this quality, more than any other, which gives it is reviving effect on those who have been living in the clogged and polluted atmosphere of large towns. Yet purity of the atmosphere per se is no preventive of those very ailments which bring the majority of patients to seaside watering-places and highland sanatoriums. If any invalid who has thus sought relief were to take careful note of the natives of his favorite health resort, he would probably be disquieted to find that pale, sickly children and ailing adults were by no means uncommon. Patients with weak lungs are often sent to winter in Devon and Cornwall, although the mortality from pulmonary diseases among the permanent residents of these favored counties is not a whit less than among the dwellers in the midlands and the north. Yet the undoubted fact remains to be accounted for that such migrants to warmer climes almost always derive marked benefit from the change.

When the late John Addington Symonds first went to live in the searching and rarefied atmosphere of the Engadine, not a few of his friends thought that he was making a fatal mistake, and that he would certainly increase the tendency to phthisis which compelled him to leave England. But since then opinion has so veered round that this Alpine Valley has become one of the most orthodox places of refuge for consumptive patients. Latterly certain dry and ele-

vated parts of South Africa and Australia have surpassed it in public favor, because it has been found in many cases that the safety of the patient depends upon his remaining permanently away from the bitter winds of Britain; and the colonies offer greater advantages in the way of occupation than do the Alpine regions of Europe.

NOT A QUESTION OF TEMPERATURE.

It is by no means easy to indicate all the reasons why the air of health resorts such as these proves so beneficial in cases of weakness of the lungs. As we have seen, it is not a question of temperature, as our ancestors imagined; and, although dryness may have something to do with it, we find that our parching east winds are peculiarly trying to sufferers from chest complaints. There can be no doubt, however, that the extreme purity of the air in these regions is an important factor in aiding recovery. Consumption, like all other diseases in which micro-organisms are the chief agents of mischief, is, according to the latest medical philosophy, a strife between the constitutional garrison consisting mainly of phagocytes, or white blood corpuscles, and the invading hordes of the enemy. The various characteristic symptoms which arise in the course of such a malady are so many phases of the combat. Many physicians hold the view that the rash on the skin in such diseases as scarlet fever and measles results from the fact that the skin, as an excretory organ as well as the chief frontier line of the body, is a highly important strategic point, and therefore attracts the combatants of both armies. In the near neighborhood of each tiny coiled sweat-gland a deadly strife goes on between the phagocytes and their microscopic antagonists, and the result is a certain amount of redness and irritation of the surrounding tissues. As a rule, the defence and attack are so conducted that the war is prolonged for days or weeks, during which time the forces on each side are nicely balanced. If the invaders can be kept in check in this manner the disease soon wears itself out, for the micro-organisms cannot stand a long siege, owing to the readiness with which they exhaust the provisions around them. There is also good reason for believing that these living poisons provide their own antidotes, for it is found that in places where they have lived a new material has been developed (probably a waste product excreted by the bacteria themselves) which is inimical to their continued existence. It seldom happens that the human fortress is carried by assault at the first onset; although in some cases of cholera, pneu-

monia, and in fact nearly all kinds of diseases caused by micro-organisms, such a rapid and fatal termination of an attack may take place within a very short time of the first invasion.

Now, in the air of this thickly populated country it has been abundantly demonstrated that living organisms and disease germs literally swarm. Not only are they set afloat in countless myriads from their breeding places (generally some living fellow-creature), but the humidity and temperature of our atmosphere serve to maintain them for some time in a lively condition and possibly to enable them to increase. It is plain that if we can lessen or abolish the influx of reinforcements the loyal phalanx of phagocytes will have a much better chance of conquering and expelling the foe. One way of bringing this about is the removal of the patient to a climate where the physical wear and tear are somewhat lessened, and where the atmosphere is not only normally free from disease germs, but is inimical to their existence outside the body. All this is fairly comprehensible; but it is evidently not the whole story. There are contiguous regions in South Africa where the air is equally pure, according to physical tests, and yet one proves favorable to consumptive patients and the other rather the reverse.

A VIRTUE IN MERE CHANGE.

This brings us back to the evident fact that there is a peculiar virtue in mere change. It seems to give a fillip to the whole system, and especially to increase the recuperative power. The persistent languor and debility following an exhausting illness, such as an attack of influenza or whooping-cough, will often disappear like magic under the influence of a change of abode. Nor is it essential that the patient should go to the seaside, or to some spot of acknowledged salubrity. Often the mere removal from one part of a town to another will result in an immediate and manifest improvement. I know of an instance in which a gentleman, a sufferer from asthma and bronchitis, whose home was in a healthy part of Surrey, obtained very great relief by a short residence among the slums of Seven Dials. Children seem especially benefited by a change of air; so much so that it is often found advisable to remove them even during a severe illness. In two cases which occur to us in which such a course was adopted, the little patients had been given up by their medical attendant because they had reached that fatal stage of exhaustion so dreaded by the physician, when all rallying power has ebbed away, and there is no more response to remedial

measures. Although it seemed doubtful in both cases whether the children would even survive the journey, an instant improvement took place as soon as the removal was accomplished, and in each case complete recovery followed. Both of these children came from homes where every comfort was provided, and from neighborhoods considered healthful.

We have little doubt that the marvellous vitality of gypsy urchins whom one sees running about clad in an irreducible minimum of raiment in damp and wintry weather, and who are nevertheless as hardy and jolly as young colts, is attributable in a great degree to their constant roving habits. It is well known that wild beasts in travelling menageries, in spite of the rough and limited accommodation which they have to put up with, are more healthy and live longer than those which have all the care which science and money can provide in the zoological gardens. Among the first elephants to breed in captivity were those in Barnum's travelling show, and this almost unprecedented event asserts in the most positive manner that the circumstances under which the animals lived were more conducive to their general well-being than those of the elephants in Regent's Park, or even in the Government establishments in India. Racehorses, it is said, are more likely to become "stale" and to deteriorate in condition when they are kept in one place than when they are travelling about to different race meetings. Not a few owners of dray horses in London, such as railway carriers, brewers, etc., find it answers their purpose to have a farm in the country, to which the horses are sent for a change when they show signs of failing health.

When we consider how unstable a substance air is, and that on at least six days out of every seven it is continually moving from place to place at the rate of several miles an hour, the difference of character in the atmosphere at neighboring spots, and the constant qualities it maintains at different times in the same locality, are very difficult to explain.

All attempts of chemists to account for these minute aerial differences, which, nevertheless, have so weighty an influence on the bodily health, have hitherto been futile. The chemical composition of air, as far as gaseous inorganic matter is concerned, varies in an extremely slight degree in different localities. Out of doors the proportions of nitrogen, oxygen and arogon remain practically constant in all regions, and carbonic acid varies only to the extent of one part in a thousand even when we compare such extremes as

the air on a Swiss mountain top and that in the most densely populated cities. The popular notion that sea air owes its vivifying effects to ozone is not sanctioned by science, for, although a certain amount of that much-vaunted gas is generally present in the air of seaside places, its action for good on the human frame is more than doubtful. On the whole, too much has been made by writers on hygiene of the deleterious effects of carbonic acid, for as long as this gas remains pure and its unassociated with the deadly carbonic oxide, or "choke damp," it does not seem to produce anything like the serious effects which were at one time supposed to follow from breathing it. Only when it is present in such large quantities as to displace the indispensable amount of oxygen does it endanger life.

Such evidence as we have would seem to indicate that the character of the air in most localities is affected in some subtle way by emanations from the soil, from vegetation, and from other animate and inanimate objects, and that this influence soon ceases when the aerial molecules are wafted away from the spot where it originated. What the nature of the evanescent material may be we are not yet in a position to say, but in most cases it is probably organic. Our delicate sense of smell tells us how full the atmosphere is of extremely attenuated organic matter. Each room, each house, each district, has its distinctive odor, which we are continually recognizing again after months or years of absence, and for which it is often impossible to account. How infinitely minute such odoriferous particles may be has been shown by the familiar experiment with a piece of musk. A small portion of this substance has been known to scent the air of a room for many months without undergoing any appreciable diminution in weight. Nothing seems more likely than that there may be a great number of substances which thus gradually evaporate and impregnate the air without our olfactory apparatus becoming in any way cognizant of them. Considering the well-known depressing or exhilarating effect of many substances (chiefly carbon compounds) which are introduced into the lungs in a vaporized or finely divided state, we are inclined to think that the invisible air-borne matters which may so affect us for good or the reverse are chiefly organic in their origin.

But even if these hypotheses were proved correct, we should yet have to explain the physiological side of the question. The reasons why mere change has such a stimulating effect on the vital forces must be sought within the body itself. Where the relative purity of the atmosphere in two localities is the same the effect of change of

air may be of the nature of stimulus to the pulmonary excretory apparatus, so that the system is freed from effete and poisonous material which would otherwise remain and prove deterimental to health. If so, it would be comparable to a change of diet, which often stimulates the excretory functions of the alimentary canal, or to one of the numerous drugs wherewith we aid such operations in various parts of the system. And just as one agent of the latter kind is liable to lose its effect if long continued, so the air to which we have become accustomed may cease to provoke efficient function in the lungs. In fact, when the effect of a change of air is compared with the action of certain medicines, many points of resemblance become apparent. In the case of both, the good results hoped for often reveal themselves only after a certain amount of discomfort and constitutional disturbance.

BIOLOGICAL EXPLANATION.

There are certain biological laws which may help us to understand, to some extent, why a change of air is so conducive to the maintenance or the recovery of health. We have learned, since Darwin's great discovery, to seek for the explanation of widely distributed vital phenomena in the distant past rather than in the present.

Without going back to any prehuman being for evidence we find some suggestive facts in the condition of existence of our primitive ancestors. The discoveries of archaeologists have abundantly proved that civilization, and all the customs and traditions which have followed in its train, are mere modern innovations, and occupy but a very small portion of the long history of the human race. The epoch during which man was a savage hunter, with no fixed place of abode, was so incalculably longer than the most extended estimate of historic time that it is impossible to ignore the influence of such a state of existence upon human nature as we find it to-day. That early man was a wanderer on the face of the earth, like all modern savages who get a precarious livelihood by hunting, is abundantly proved. With the change of the seasons, or as game became scarce in the vicinity of his cave dwelling, he was compelled to migrate from place to place, in search, not of change of air, but of bare sustenance. That such habits, prevalent through so long a period, would be likely to leave a lasting impress on every cell and fibre of the human frame is more than probable. And if these were the prevailing conditions of environment during the

manufacture, so to speak, of our physical constitution, it seems reasonable to infer that somewhat similar conditions would be those most favorable to the smooth working of the bodily machinery in modern times. It was found that the unfortunate natives of Tasmania, bred among the hills and woods, perished rapidly when removed to a totally different environment on Flinders Island, and the dwarfs which Stanley discovered in the dense and gloomy forests of the Aruwhimi, only lived a short time if forced to dwell in a more open and sunny region. If, therefore, a race of nomads, to whom vagrant habits had become a second nature, were compelled to live permanently in one spot, one would expect that some evil consequences would ensue, and that these would be especially liable to show themselves when the general vitality had been lowered by disease. And, conversely, it seems reasonable to conclude that a renewal of the conditions to which the constitution of man was originally adapted contribute to the recovery of a normal state of health.—From the *National Review* for July, 1896.

THE LAND OF THE LILY AND THE ROSE.

By Roland Belfort.

Radiant in the eternal sunshine of the Southern Atlantic lie the Bermudas, those picturesque islands discovered by Juan Bermudez in 1515, colonized by the English a century later, and celebrated

in song by Shakespeare, Marvel, Moore and other poets. For Britain Bermuda is a western Gibaraltar—a stronghold on which millions have been spent for fortifications. Its geographical position renders its maintenance in defensive efficiency an imperial necessity. Naval rendezvous, coaling station and fortress, it occupies a central position in our trio of Atlantic naval stations—Halifax, Bermuda and Jamaica. Our American cousins regard these islands as a delightful sanatorium. "Stolen America," as they often term them, is a favorite resort of many wealthy invalids and pleasure-seekers, who fly to these "summer isles" at the approach of winter.

Situated about two thousand miles southwest of England, seven hundred form New York and about seven hundred and fifty from Halifax, N. S., Bermuda comprises three hundred and sixty-five islets, built on the peak of a submarine mountain covering an area of twenty square miles and rising over two hundred and thirty feet above sea. They extend in an irregular course, in shape something like a fish-hook, the curved end lying to the westward and forming the deep, commodious, land-locked harbor of "Great Sound." Shakespeare, with poetical license, describes these islands as being of coral formation, but modern science proves they have been formed by the perpetual drifting up of sand, which time and pressure have hardened into the famous Bermuda stone. There are six principal islands — the Mainland (on which Hamilton is situated), St. George's, St. David's, Somerset, Boaz and Ireland. Connecting bridges and causeways facilitate inter-communication. The other islets are scattered about in picturesque irregularity, each possessing some particular charm due to its conformation, position or scenery. Pretty lakes, miniature bays, rising hills crowned with powerful forts, flower-decked valleys, a wealth of luxuriant vegetation and numerous white and glistening cottages, impart a diversified aspect to the landscape. Several miles out to sea a cordon of sunken reefs encircles the islands. The channelways through this natural rampart—reared in the course of countless centuries by the drifting and hardening of the sand, and its subsequent subsidence—are extremely narrow and tortuous, so that these reefs constitute a protection that renders Bermuda practically impregnable.

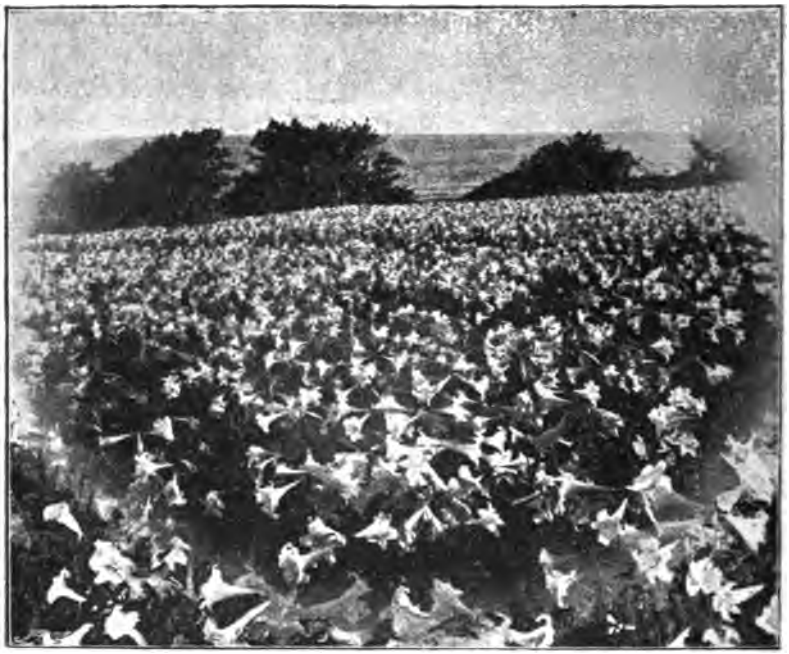
The first view is particularly enchanting. A tiny speck in the ocean emerges above the horizon, increasing in size until one sees floating on the bosom of the waters a lovely island—a symphony in

green, white and gold. At the northeastern extremity, nestling in a grove of cedars, stands St. David's, with its lofty white lighthouse, which flashes out a nightly welcome—and warning—to approaching ships. Our ship then reaches a narrow channel leading into the interior. Here vessels may often be seen performing what appears to be a journey across the land—their upper spars being seen slowly moving amongst the numerous islands. To the left is St. George's, with its long range of white barracks, which served as quarters for the Grenadier Guards during their temporary exile.

No seaport in the world has such a curious approach as Hamilton. The town, buried in the interior, is not visible from Grassy Bay—a commodious harbor lying midway between Hamilton and Ireland island—and it is impossible for any stranger to divine its direction. The ship is carefully steered through mazy channels, past flowery islets, through passages no wider than the Strand. (These channels are now being superseded by wide and deep passages, at a cost of £40,000.) For some time not a glimpse of the town is obtained; then the ship suddenly emerges into a broader channel, rounds yet another point, steams into a harbor and arrives in sight of Hamilton, a city entirely composed of white houses built on a slope running down to the water's edge. On the opposite side of the narrow harbor is a range of cedar-covered hills. Hamilton is a bright little city, intersected by the whitest of streets, the white-roofed houses being half hidden by cedars, palms, pride of India and a variety of brilliant flowers. Everything glistens in the sunlight; the waters sparkle, the yachts and other craft dance at their moorings, steam pinnaces manned by white-jacketed tars puff their way across the harbor, pleasure boats dart hither and thither, while the restless rattle of steam gear is heard from the New York steamer discharging cargo. Not far from the waterside, at Par-la-Ville, Queen street, is an immense india-rubber tree, which, shooting out its huge limbs from very near the earth, extends across the street, affording delightful shade. Mark Twain is said to have picked from this tree various india-rubber articles for domestic use. As no one has done this since, it must be inferred that the genial humorist arrived at a very favorable season. Hamilton being the seat of government, the centre from which everything radiates, it is there we find the Parliament House, government offices, public library and the like. The administration of Bermuda, with its population of fifteen thousand—six thousand whites and nine thousand colored—is vested in a Governor, who is also

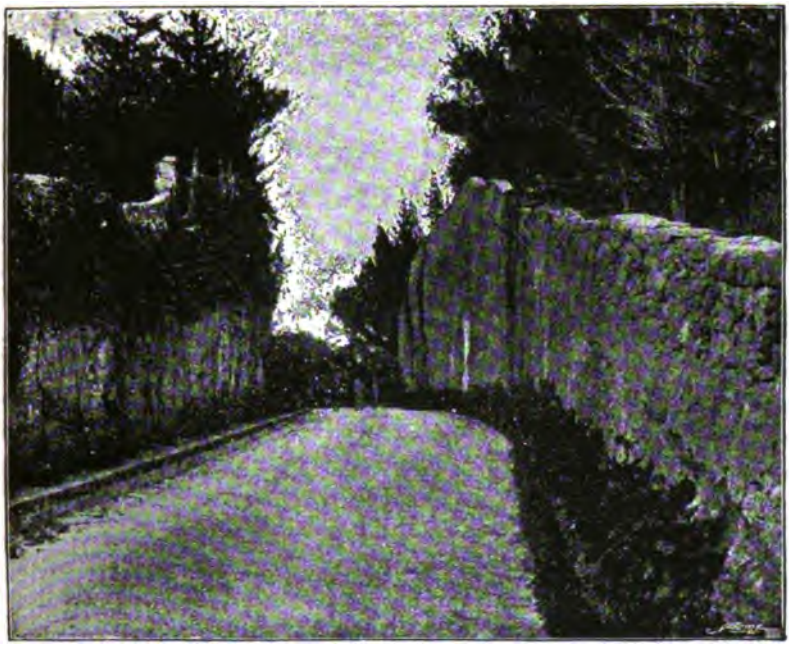
commander of the forces. The present titulary is General T. C. Lyons, C.B., a distinguished officer with a brilliant record. He is advised by an executive council of six members, and there is a legislative council of nine members selected from amongst the principal judicial and executive officers. The House of Assembly, elected by popular vote on a register of 1,161, consists of thirty-six members. Its proceedings would not appear exciting to an outsider, but they are, notwithstanding, remarkable for the sensible and practical manner in which all subjects under discussion are dealt with. The various branches of the public service as organized in England all exist here—in miniature. Bermuda claims one distinction—it has escaped the visitation of the Salvation Army. But the existence of public spirit and religious enthusiasm is attested by the handsome cathedral recently erected. English names are common—Warwick, Southampton, Somerset and Devonshire, all remind one of home. So does the British coinage, which alone passes current here. Most of the shops are like country stores. Confectionery may often be bought in a shoe shop, postage stamps and vegetables at a grocer's, jewelry in a furniture store. There is one edifice which serves as a walking-stick maker's store, Mechanics' Institute and Methodist chapel.

Bermuda has an aristocracy, composed of the descendents of the pioneers and of certain colonists who made their money by blockade-running during the American war. Captious critics assert that these enterprising old-timers also indulged in a little wrecking—and even piracy—when the occasion was very tempting! But this is probably the idle gossip of envious tongues. Many names on old records, Darrell, Tucker, Outerbridge, are still in evidence to-day. Naturally, the presence of the military and naval forces and the execution of many public works tend to stimulate business. The Bermudians carry on a considerable export trade—principally with the United States. The chief products are onions, potatoes, lily bulbs, arrowroot and tomatoes. About £80,000 worth of potatoes and onions are shipped to America every year. Their crops being first in season fetch high prices. The leading fruits are the banana, melon, grape and peach. Great attention is now being paid to the cultivation of flowers, vegetables, silk worms and tobacco. Some of the lily fields are forty acres in extent, and when in bloom present a strikingly beautiful sight. The buds are so carefully packed for shipment that they blossom—often remaining fresh for a fortnight after their arrival in America. The colored laborers



earn good wages, and most of them have a cottage, a patch of ground which is a flowery paradise, and a goodly collection of children. They make loyal citizens and are gradually increasing the general welfare of the island by purchasing and cultivating small plots of land. The educational system is good, religious and social work is well maintained; taxes are nominal, and serious crimes are practically unknown. The men are comfortably dressed, whilst the attire of the women is often gorgeous. On Sundays and holidays they appear in flaming yellows, bright pinks, rutilant scarlets—their favorite tonalities. Patent leather boots, immense feathers and dainty parasols are not rare. Men, women and children look pictures of beaming health and contentment.

Every visitor is struck by the excellence of the roads—marvels of durability and good workmanship. They are made from the solid sandstone, sawn out, planed down to a level, or formed of debris of the same material, which the sun rapidly hardens. There are over a hundred miles of these highways, which render walking, driving, and cycling a positive pleasure. Three trunk roads, broad, white and smooth, running north, south and through the centre, together with good cross roads, intersect the main island.



The walls and roofs of Bermudan houses are made of this sandstone. In excavating for a cellar enough material will be removed to build and roof the dwelling. It is easily cut into any shape direct from the quarry by means of saws. As the people depend on rain water for drinking purposes, every house is provided with an underground cistern, and every roof is kept well whitewashed, so that the water caught is pure and clean.

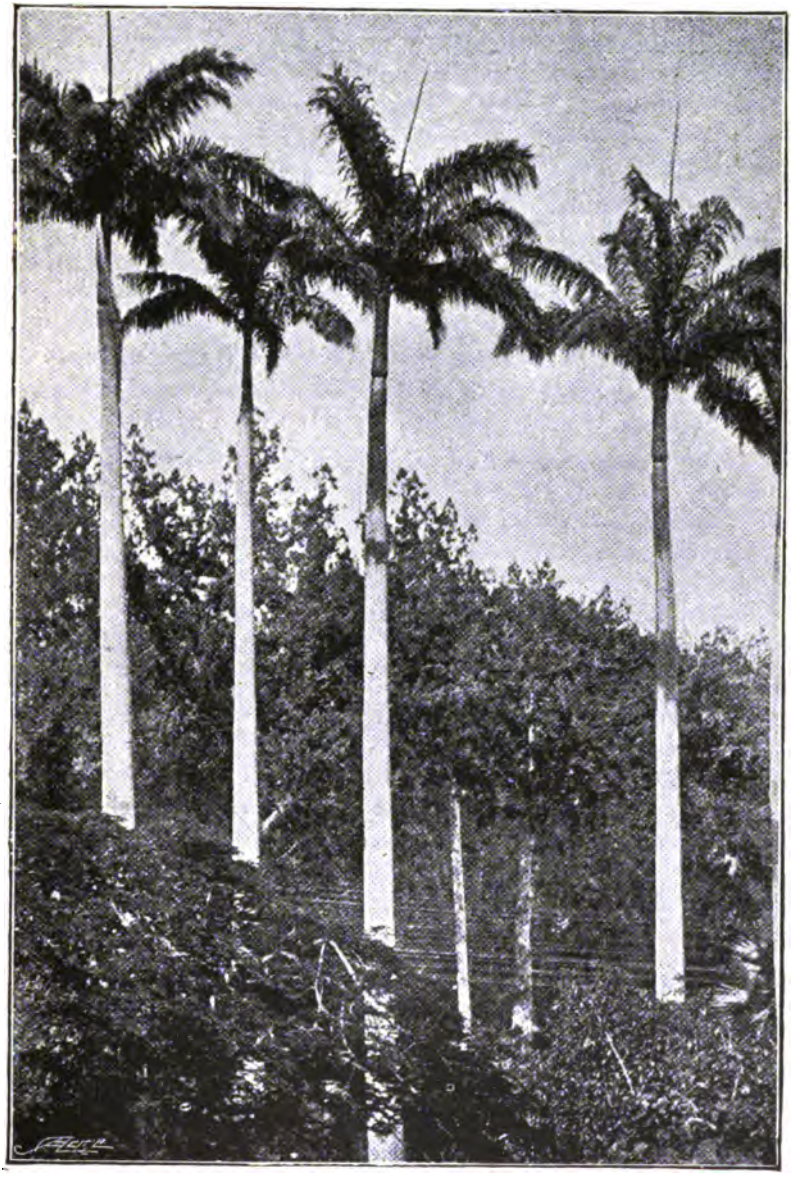
The climate, especially in winter, is simply charming. Many distinguished visitors, including Thomas Moore, Princess Louise, the Duke of York and Mr. W. S. Gilbert have praised its beauties. The daily range of temperature from December to May is between 65 and 75 deg. Fahr. There are, however, days when a fire is a welcome luxury.

The wind is somewhat erratic. It occasionally blows during August with cyclonic force from every point of the compass in the space of two hours. With surprising suddenness it veers round from some mysterious corner, big rain-clouds gather, Boreas sounds a thunderous alarm and a drenching rainstorm bursts over the islands. The lighthouse on Gibb's Hill trembles and quivers, the waves are angry on the reefs, and the ships in the bay can

scarcely keep to their anchors. But the tempest as suddenly ceases, the rain is quickly absorbed, the sun pierces through the wind-driven clouds and the verdant isles, refreshed by this natural shower bath, shine forth with greater brilliancy than ever. There are no wild animals, snakes, or noxious insects in Bermuda. But the tiresome mosquitoes and the harmless and pretty lizards are very plentiful, especially during the summer.

In December the Quebec steamship Company organizes a weekly service between New York and Bermuda. The voyage, performed in forty-eight hours, is really a fairy transformation scene. The ship steals out of New York harbor with its blizzards, fogs and generally arctic espect. But after the first day the Gulf Stream works a beneficial change. Wraps and winter clothing are thrown aside, balmy breezes begin to blow, a genial sun tempts even the most timid invalids on deck. The following morning the delighted passengers catch their first view of the "summer isles." The principal hotels are the Princess, named after Princess Louise, and the Hamilton: two immense and luxuriously appointed establishments. The Princess is built on a bold elevation near the harbor, its southern front reaching to the water's edge. The Hamilton, belonging to the corporation, occupies a prominent position, and stands in its own grounds. From its balconies extensive views of the city, harbor and surrounding country are obtained. Both houses are worked on the American plan—long drinks at the bars, a multitude of funny little dishes on the tables, rocking-chairs in all the rooms and on every balcony, and other essentially American accessories, without which it is doubtful whether the Yankees would appreciate even the beauties of Bermuda. There are many charming villas belonging to prominent Bermudans. They nestle amongst palms, cedars and lilies, literally covered by a profusion of flowers. Prominent amongst them is Mount Langton, a commodious residence recently built for the Governor on a slope facing the sea. Beautiful birds formerly frequented the island, birds whose delicacy of hue and originality of form were a continual source of astonishment and delight. But only the red cardinal and the blue jay now remain. Myriads of crickets keep up a continual buzzing. At Warwick are four magnificent palms, known as the Royal Palms, whose smooth and shining trunks and delicate foliage produce a truly tropical effect. The most delicious ferns peep from every hollow and crevice, the hedges are covered with roses,

oleanders, bougainvilles and a thousand other brilliant-hued flowers.



Frequently wealthy Americans yachting in the summer seas pay a flying visit to Bermuda, where they are sure of a warm welcome

from the Royal Bermuda Yacht Club—a prosperous institution, with a membership of a hundred and twenty and a fine clubhouse. Many of the yachts are as trim and graceful in their lines as any to be seen at Cowes. Bermuda has always been celebrated for fast-sailing yachts and dinghies. During the season regattas are organized in which their sailing qualities and the seamanship of their owners are fully developed. Very diversified are the attractions offered to the invalid and the tourist. Near the Hamilton is Victoria Park, with its Jubilee Pavilion and wealth of tropical plants, palms, cacti, etc Military bands give weekly concerts here. During the season it is the rendezvous of a gay and fashionable throng of American visitors, officers and wealthy residents, who meet to enjoy the pleasures of an open-air promenade concert. Here also is the beautiful avenue of cedars. Their thick foliage, meeting and mingling overhead, renders it a deliciously cool promenade and cycling track. Ireland island is an extremely popular excursion, combining the pleasures of a yachting trip with a visit to a big arsenal. Once a day the Moondyne runs across from Hamilton. The principal object of interest is the floating dock. This enormous basin was built on the Thames and towed to Bermuda by two men-of-war. It resembles a huge undecked ship with its extremities cut sharp off. It is 381 feet long, 123 feet broad, 75 feet deep and weighs 8,340 tons. Three million rivets keep it together. When full it holds 37,000 tons of water. The powerful dock machinery lifts a ship of 10,000 tons—making, with the weight of the dock, 18,340 tons. Then there are the warships, the armories and the fitting shops to be visited. The dockyard looks dingy, scorched and somewhat antiquated. There are a few rusty torpedoes lying about, looking like so many gigantic land crabs. England's proud claim to be "mistress of the seas" is recalled by the presence of the old line-of-battle ship Irresistible, which was with Nelson at the Nile and Trafalgar. This hoary veteran is used as a lodging-place and mess-room for the dockyard laborers.

The military headquarters are at Prospect Hill, a commanding eminence from which beautiful panoramic views are obtained. A portion of the troops occupy St. George's Barracks, whilst at Warwick there is also another camp. Towering above everything else on the island stands Gibb's Hill Lighthouse, which is 133 feet high, 362 feet above the sea level and visible about thirty miles out to sea. Lloyd's Signal Station is close by, and is placed in direct communication with Hamilton Telegraph Office, whence shipping news is

promptly cabled to London. Panoramic views of the entire group are obtained from this much frequented coign of vantage. Between Hamilton and St. George's is Flatt's Village, situated near Harrington Sound, a pretty inland lake having an extremely narrow outlet to the sea. Near here is the "Devil's Hole," a pellucid pool thirty feet deep, containing a marvellous collection of fish Amongst other varieties are hamlets, groupers, snappers and angel fish. Angel fish in the Devil's Hole! This last species is peculiar in shape, and its color is of a deep marine blue. Some of the fish are said to be a hundred years old. The voracity of the groupers is astonishing. They literally tear into shreds the small fish thrown in to them, making the pool boil in their frantic efforts to get their share of the prey. Some of the stronger ones keep their heads clear out of the water, their huge, ugly mouths wide open, ready to catch any stray morsel. There is a tradition about an unfortunate baby, which being dropped in by a careless nursemaid, came to a pitiful and untimely end. But this horrible legend has never been confirmed.

Not far from here is Walsingham House, where Thomas Moore dwelt during his stay in Bermuda. Here is the famous calabash tree under which he composed some of his poems. In the vicinity is one of the Walsingham caves. To reach this lovely grotto visitors clamber over and down an irregular pathway. Inside the grotto the limpidity of the water is truly marvellous, and when a light is struck the scene is like a glimpse of fairyland. In the Museum at Edinburgh is a splendid stalagmite cut from this cave by Admiral Milne—an act of vandalism which will, it is hoped, never again be perpetrated. It has been calculated that this stalagmite had grown by increasing about an inch every ten years, and that a period of 600,000 years must have been required to form it! The glory of Walsingham House has long since vanished, and an air of desolation pervades the place, now deserted save by spiders, ants, lizards and other insects.

St. George's was the capital of Bermuda until dethroned by Hamilton—thus creating a feud which is happily dying out. It is an antiquated old town, sun-scorched, forlorn, as if mourning its ancient grandeur. But its fortunes may revive when the channels leading to its fine land-locked harbor are deepened. Besides the barracks, there are forts at St. George's. But civilians are not allowed to visit fortifications here or elsewhere. They can, however, wander in the public gardens, through the cool and flowery cem-

etery, and sit in the shade of the date palms that abound at various points. They can also admire the monument to that brave old sailor, Sir George Somers, after whom the town is named. There is another unfailing source of enjoyment—that of exploring the reefs at the North Rock. The Duke of York, during his cruise on the Bacchante, spent a full day there, and has recorded his delight with everything he saw. Visitors scan the ocean bed beneath the crystal waters with water glasses—long boxes with a piece of plate glass at the lower end. These, dipped into the water, afford a capital view of the bottom. The reefs are broken into cells and grottoes of fantastic shape, each one decorated with tropical vegetation, seaweed of all colors and shapes, lilac-colored wavy fans, lumps of coral with pearl oysters amongst them, flowers and leaves in a thousand surprising forms, sea urchins, starfish, and a hundred other curious objects. Owing to the limpidity of the water, the slightest movement of the fishes may be observed. Amongst many varieties of beautiful fish one sees the "yellowtail," which is pale azure on the back, pearly white below, with broad bands of yellow along each side. Then there is the "spotted snapper," which also carries three yellow bands, but his body is white, his fins pink, whilst each flank is adorned with an oval patch of jet black. The presence of the visitors and the squadron, the bustle attending the shipment of the crops to New York, the increased number of passenger steamers, all lend an animation to the winter scene which is wanting in summer. The Americans stay until about April, when the advent of spring tempts them home again. The big hotels are then closed and business becomes dull. The Bermudans, counting up the season's gains, project summer tours to cooler climes. The islands, having lost their gayest elements, relapse into comparative torpor until the following season.

It would not be surprising if this charming spot should attract many travellers in search of fresh fields of observation and pleasure—especially if some line of West Indian steamers should decide to call there. Indeed, direct communication by fast steamers between England and Bermuda is mentioned as one of the possibilities of the future—at least during the winter season. This would probably prove advantageous to many delicate persons to whom the English winter is injurious, and to some for whom the Bermudan climate might prove more beneficial than that of Madeira.—*The Ludgate, February, 1896.*

THE CONTROL AND SUPERVISION OF PUBLIC WATER SUPPLIES BY SANITARY AUTHORITIES.*

By C. Porter, M.D., Ireland; D P.H., Camb; M.R.C.S., Eng.;
Medical Officer of Health for Stockport.

Water supply for drinking purposes has always been an imperative necessity to life, and many writers have observed that means of ready access to water in sufficient quantity has from the earliest times been a most important factor in determining the site of human settlements. Whether primitive man displayed similar anxiety in regard to the quality of the supply is open to doubt; doubtless he preferred clean to dirty water, if he could get the former; but, as Sir John Simon has remarked, sanitary motives were probably of little appreciable value in determining his preference; and where populations abstained as far as they could from polluting streams which gave common water supply, it was more likely under sanction of a religious sentiment which we may regret that our after-times have not retained. The same writer adds that among the ancient Greeks and Romans deliberate wilful pollution of the river that gave drinking water would have been an inconceiveable impiety and sacrilege, and quotes a fragment of the older Roman law which emphatically forbids and penalises the pollution of public water supplies. Coming to our times and country, we find that under the Waterworks Clauses Act, 1847, the sum of £5, and a daily penalty of £1 for a continuing offence, is forfeitable to the proprietors of a water undertaking by any person who bathes in, or causes any animal to enter, any stream, reservoir, aqueduct or other part of a waterworks, or who fouls the water thereof by washing in it clothes, wool or skins, or by allowing any water from a sink, drain, sewer or other foul source to enter therein. But that these salutary provisions are not always enforced as they ought to be is evidenced by the admitted pollution of the metropolitan sources of river-water supply; and I myself have personal knowledge of a case in which, for many months after attention had been called thereto, the drainage of several houses continued to seriously pollute streams of water which ran almost at once into the reser-

* Abstract of Paper read at the Congress of the Sanitary Institute, at Newcastle-on-Tyne, September 2, 1896.

voir of a rich water company. Possibly others have similar experiences, and it might be well if, in addition to water companies, which have been known to be more or less indifferent to such occurrences, the sanitary authority of the district served had power to exact the penalties referred to.

The scruples of the Greeks and Romans in regard to the pollution of public water supplies is perhaps the more remarkable as we bear in mind that these ancients had probably little, if any, precise knowledge of the colossal power for evil of specifically-polluted water as a vehicle of disease. In our time no such excuse can be put forward, for this truth has been driven home and, so to speak, writ large in human blood times without number during the past half-century by the four cholera epidemics in England during that time and the fearful visitation of Hamburg in 1892, as well as by the countless outbreaks of enteric fever, of which the recent experiences of Worthing and Tees Valley are not the least remarkable examples. The extent of popular indifference and inattention to questions of public water supply, and the almost complete absence outside the metropolis of power to ensure proper watchful insistence that such supplies shall be adequately guarded from pollution, is therefore most extraordinary, and, when asked to contribute a paper to the proceedings of this section, it seemed to me that no more useful purpose could be served than once more to call attention to the impotency of sanitary authorities in this respect when, as is too often the case, the supply of this first essential of life, cleanliness and comfort is suffered to be a trade monopoly in the hands hands of private individuals or commercial companies, instead of being controlled by, and existing solely for, the mutual hygienic and pecuniary advantage of the ratepayers at large. Let us briefly consider some of the

PRINCIPAL POWERS AND DUTIES OF SANITARY AUTHORITIES

in regard to water supply. The Public Health Act, 1875, sec. 51, enacts that any urban or rural authority may provide their district with a supply of water proper and sufficient for public and private purposes; and though the words "may provide" are permissive and enabling, if the local authority do not avail themselves of this power where water is required and they can procure it, they will be in default, and can be compelled by the Local Government Board to make such provision (*ibid.*, sec. 299). For the purpose stated the local authority may either contract with any person for a supply, or construct or purchase waterworks; and sec. 55 orders that the local

authority shall provide and keep in such waterworks a supply of pure and wholesome water. It is rather curious that the Public Health Act contains no such specific requirement in regard to private water undertakings, but this is to some extent met by sec. 35 of the Waterworks Clauses Act, 1847, which requires such private persons or companies to provide and keep in the pipes to be laid down by them a supply of pure and wholesome water sufficient for the domestic use of all the inhabitants within the limits of their area of supply. Within the service area of a legally constituted company a local authority cannot, however, construct waterworks (except for the supply of water for their own use) so long as that company are able and willing to supply water proper and sufficient for all reasonable purposes for which it is required; and sec. 52 provides that any difference as to what is proper and sufficient is to be decided by arbitration. By the Public Health Act, 1875, sec. 70, any local authority is empowered under certain conditions to obtain a justices' order for the permanent or temporary closure or limited use of a public or private pump, well tank, or cistern. Lastly, the Public Health (Water) Act, 1878, sec. 7, makes it the duty of every rural sanitary authority from time to time to take such steps as may be necessary to ascertain the condition of the water supply within their district, and if there be reasonable ground for believing that any house therein is without a proper and sufficient supply of wholesome water, the authority, or any of their duly-authorised officers, are empowered to enter the houses in question, *or the premises from which the water supply may be derived*, for the purpose of ascertaining whether such house has such a supply within a reasonable distance. Sec. 11 empowers the Local Government Board to invest any urban sanitary authority with all or any of these powers; but having raised the question in the borough for which I act, I was advised by the town clerk (Mr. Walter Hyde, senr.) that neither the general intention of the Act nor the actual wording of the section appear to justify compulsory entry on any waterworks outside the district, and probably not inside; much depends, I am informed, on the meaning of the word "premises." This is certainly an interesting point, upon which the opinion of any legal gentlemen present would be of interest.

IN THE METROPOLIS

matters are in a much more satisfactory condition, for we find that the Metropolis Water Act, 1852, sub-sec. 9 *et seq.*, empowered the

Board of Trade upon receipt of a written memorial as to the quantity or quality of the water supplied by any company, and signed by not less than twenty inhabitant householders paying water rent therefor, to appoint a competent person who, after notice in writing to the company, shall have power to inspect and examine the waterworks of the company, to inquire into and concerning the grounds of such complaints, and who shall, under very heavy penalty of neglect or refusal (*vide* sec. 16 *ibid.*), be afforded by the company and their officers all reasonable facilities for such inspection, examination and inquiry. Whether or not this right of complaint and inquiry was availed of to any great extent by consumers I have been unable to ascertain, but it is suggestive that, to again quote Sir John Simon, "after many years of disgusting disclosures and after various very terrible disasters" and "after gigantic crucial experiment performed on half a million of people," the Board of Trade were empowered by the Metropolis Water Act, 1871, sec. 35, to conduct such inquiry notwithstanding that no complaint had been made and signed by twenty inhabitant householders. In addition, the following section of the same Act initiated a noteworthy step in the right direction, by creating the office of water engineer, such official to be a competent and impartial person from time to time appointed by and removable by the Board of Trade, who shall from time to time, in such a manner as the Board of Trade direct, examine the water supplied by any company. According to the evidence given before the Royal Commission on Metropolitan Water Supply, 1893, by Major-General de Courcy Scott, R.E., the present incumbent of the office (*vide* Minutes of Evidence, p. 495, par. 12,909 *et seq.*), this appointment is apparently now made and the above-mentioned powers are exercised by the Local Government Board. He informed the commission that his statutory duties involve periodical inspection of the metropolitan filtering works, attached reservoirs and water supply, to ascertain whether or not the water companies have complied with the provisions of sec. 4 of the Metropolis Water Act of 1852, which requires that every company shall effectually filter all water supplied within the metropolis for domestic purposes before the same shall pass into the pipes for distribution. General Scott adds that the definition "efficient filtration" is understood to mean, under the Act of 1852, that "the water in its physical appearance shall be clear, bright and free from suspended matter," and that his instructions and procedure are to col-

lect samples of effluent as it issues from the filters and to examine each in a 2-ft. tube as these qualities. I make bold to say, in passing, that such instructions and such a test appear to be crude in the extreme, for at the sewage works of a large city I have recently seen an unsatisfactory sewage effluent that would unquestionably have admirably complied with all these requirements, and almost every one knows that during the cholera outbreak of 1854 the death-dealing water of the celebrated Broad-street pump was bright clear and sparkling. Such puerile regulations could never have had the sanction of the State's responsible medical advisers, and presumably represent the humorous ideas of potability of the Board of Trade layman or the prehistoric reminiscences and practice of some fossilised water engine, of which latter curiosity it is not yet, perhaps, impossible to find specimens. Reverting, however, to the functions, etc., of the water examiner, General Scott stated that he possessed no compulsory powers of entry and inspection except to the filters and for seeing samples of water. He has, besides the foregoing duties, some others to perform, if required—*e.g.*, to investigate and report upon complaints as to the volume and quality of the water services, the effects of sewerage and other works on the sources of supply, and he may be temporarily invested with the powers of a Local Government inspector for the purpose of holding a local inquiry into the quality of water supplied by a company. In addition to the supervision exercised by the water examiner, Dr. E. Frankland, as is well known, is employed by the Local Government Board to examine chemically and in regard to bacterial purity the metropolitan waters as delivered; and at the request of the associated companies these examinations have been extended to the raw river waters *at the intakes* and to the effluent water as it *issues from the various filters*. Nevertheless, with these facts before them, the recent Royal Commission, having recommended the strict enforcement of suitable regulations as to the storage and filtration of Thames water, conclude by enunciating the following admirable sanitary maxim: "This enforcement should be entrusted to the public water examiner, who should have the legal right of entry into all the waterworks and the duty of reporting periodically as to the due observance of the conditions laid down. At present the examiner is only admitted on suffrance, and though he has distinctly informed us that he has always been admitted not only without hesitation but with all courtesy by the various companies,

it is plain that the standing ground of a man who is inspecting by right is very different from that of one who is only present by courtesy."

CONCLUDING REMARKS.

If this excellent recommendation be necessary in regard to the metropolis, where the water examiner appointed by Act of Parliament has been invariably admitted "without hesitation and with all courtesy," how much more strongly does it apply to those other less fortunate parts of the kingdom where there is no water examiner, and where private companies who have acquired the monopoly of supply too often wrap themselves up as above interference, and adopt a positively ludicrous air of virtuous surprise and indignation when any suggestion is made as to shortcomings in the quantity or quality of their commodity. At present, except in regard to the closure of polluted wells, pumps, etc., and the limited and questionable powers possessed by rural authorities under the Public Health Water Act, 1878, there is outside the metropolis no legal basis whatever for the obvious moral right of sanitary bodies to satisfy themselves that the sources and methods of purification of the water supplied to their districts by commercial companies is such as to leave no room for the entry to the distributing mains of matters of noxious nature. The Public Health Acts confer upon sanitary authorities and their officers adequate powers of entry and inspection as regards the premises and articles sold by vendors of bread, flesh, fish and other eatables, while as regards milk the infectious Diseases Prevention Act extends the right of inspection of dairies, cowsheds, etc., possessed by the medical officer of health within his district to dairies, cowsheds, etc., entirely outside his district where circumstances render such inquiry as to the pedigree of the milk. It therefore seems to be an unaccountable anomaly that as regards the sources, etc., of supply of vendors of water the health officers of a community may have no right of entry. Mr. Ernest Hart has already referred to the matter in so far as county councils are concerned, desiring that their officers should have this right in regard to the supplies furnished by sanitary bodies as well as public companies. But this power should by all means be also in the hands of sanitary authorities where the district is at the mercy of private companies, and there is consequently "the temptation to choose between dividends and disease," as Sir A. K. Rollit, M.P., has pithily said in regard to the notorious shortcomings of the East London

Water Company. Admission "on suffrance" by special previous appointment is all very well as long as matters are fair and above board, but is not all that can be desired when reason for its sanction is most wanted and may be refused. Prof. Koch has remarked: "If a misfortune results from defects in waterworks it is not one affecting a few individuals but the health and lives of thousands," and I would therefore venture to urge upon this meeting the necessity of organised effort to acquire, for any persons duly authorised on that behalf by any sanitary authority, the right of entry at any time by day or night to every part of every source from which water for the public supply is obtained, and especially to those places in which filtration or purification is effected.

In the discussion which followed Dr. Porter's paper Sir Douglas Galton expressed himself as not quite so strongly in favour of much additional power, because he thought medical officers at present had power to ascertain whether water was pure. There was no doubt it was of great importance to give to authorities outside London power similar to that which was given in London, of appointing a water examiner or analyst in each county, and then for the medical officer of health for the county, town or district to be able to put in force those powers which the water examiner in London could exercise. He would not, however, advocate placing them under the Local Government Board or the Board of Trade. Dr. Squance (Sunderland) said there was no doubt it would be infinitely preferable to have water supplies controlled by the sanitary authorities, but it was difficult to educate local authorities up to this belief.

POPULAR EDUCATION.—"John, where's your daddy?"

"He's out yonder gittin' beat fer Coroner."

"An' yer uncle?"

"Seein' how close he kin come ter bein' Sheriff."

"An' Bill—where's he?"

"Well, Bill don't amount ter much, and I've hearn tell they're gwine ter send him ter Congress ter get shet of him."

"An' you—what's you a-runnin' fer?"

"Nothin'. I'm the only one in the family what ain't got no eddication, so I'm teachin' of a school fer a livin'."—*Atlanta Constitution.*

BHOWANI, THE CHOLERA-GODDESS.

SOME EXPERIENCES IN HINDOO SANITATION.

By E. H. Hankin.

That an Englishman on visiting an Indian village in which cholera was raging should be able to offer the inhabitants no advice which he was certain was good and at the same time practicable, except that they should pray to Bhowani, the Cholera-Goddess, may appear a matter for surprise to people in England. When it is further explained that the Englishman had come to the village furnished with such resources of modern science as a portable bacteriological laboratory, which included an autoclave and an immersion lens, and that he had some experience of cholera epidemics under different conditions in India, the surprise will not be lessened; neither will it be diminished when it is learnt that Bhowani is another form of Kali, the terrible goddess of the Thugs, those road murderers who used to appease her by offering human sacrifices. Nevertheless, this was my experience on the occasion of a visit which I made to the Balrampur district in the autumn of the year 1894, and I venture to think that an account of my experience may prove of some interest.

Balrampur is a small native state, about half as large as Enland, situated to the north of the River Gogra, and lying within sight of the snow-clad ranges of the Himalaya Mountains. Much of it is frequently flooded. Fever is constantly present, and cholera breaks out almost every year. No railway exists nearer than Gonda, which is twenty-six miles distant from Balrampur, the chief town of the state. One or two roads run through the district, away from which travelling is difficult, especially during the rains, when, as was my own experience, the tracts are impassable for horses and heavy going even for elephants.

My object in spending a few days' leave in this place was to see if it might not be possible to check the march of cholera by disinfecting wells. Thanks to the kindness of Colonel Anson, the Political agent, I found myself installed in a comfortable bungalow, with the town in which cholera was present on one side, and the village of Dhusaha, in which the disease was also raging, on the other. A solider belonging to the state had died in the compound and one of the only two Europeans in the place had died of the same disease,

in each case a few days before I arrived. I afterwards found that two out of the three wells in use in the compound contained the microbe of cholera, and were probably responsible for these deaths.

The villagers at first objected to my putting any medicine in their wells. I regret to say that, so far as my experience goes, the first symptom of civilization among the lower classes in India is that they develop a sort of inverted conscience, which pricks them whenever they tell the truth. In Dhusaha this influence had not yet arrived, and consequently my suggestion to put a medicine in their wells was met with a plain-spoken and unambiguous refusal. I therefore spent my first few days in the place in making bacteriological observations and in studying the beliefs and customs of the inhabitants.

The village Dhusaha consists of a collection of mud huts. There had been about 320 inhabitants, but seventy-eight had died of cholera in the epidemic that was then existing. The water supply is obtained from four shallow wells. The mud huts are constantly falling down in the rains, and mud to repair them being taken from a piece of waste land, the hollow thus formed has gradually formed a tank. Refuse is usually thrown down on the margins of the tank; hence, its water is so putrid that the inhabitants not only do not drink it, but I believe do not use it even for washing clothes. The inhabitants pointed out to me that the reason why the water in one of the wells was bad was that it was situated near the tank, and that the bad water from the tank travelled along under the ground to the well and gave a disagreeable taste to the water. I afterwards found that the water of this particular well contained no less than 7,000 microbes per cubic centimetre, and thus thoroughly deserved the character the villagers gave it.

The inhabitants are all high-caste Hindoos, mostly Brahmins. Not a single sweeper or other low-caste man was in the place. Being of high caste they only eat food which has been cooked by themselves, and this only when it is perfectly fresh. They eat no sweet-meats or other food brought from the bazaar in the neighbouring town. Their food consists almost entirely of rice and pulse, with occasionally a little unrefined sugar or dried mangoes.

But what chiefly aroused my interest was their views of cholera, and their religious observances in the presence of this scourge. If cholera breaks out in a village, the inhabitants say that it is due to Bhowani their goddess, or to the army of Bhowani being present

in the place. They regard it as a judgment for their sins and shortcomings, and, as in other religions, they consider this evil to be a blessing in disguise. They immediately commence to propitiate the goddess by sacrificing flowers and rice. When travelling through the district the first sign of the presence of cholera which struck the eye was a small booth of grass mats surmounted by flags borne on long bamboos. In Dhusaha such a booth had been erected on the margin of a well which contained the cholera microbe, and in this booth the chief 'jogi,' or priest, of the village prayed with about a dozen of the older villagers. I myself heard him praying on three successive days in a loud voice, and I believe he prayed the whole day long with scarcely an interval for refreshment. I shall mention him again later on.

The villagers in this district, however, not only attempt to propitiate Bhowani by prayers and sacrifices, but also by certain rules of conduct, which appear to me to be of interest and importance. Firstly, they say that Bhowani will be angry if any of the inhabitants leave the village. Secondly, they say that she will be angry if any outsiders are allowed to come into the village at a time when cholera is present. A curious incident illustrating the good effect of this belief happened at about this time in a couple of villages some distance from the town of Balrampur. There was only one well between the two villages. Cholera one day broke out in the village which possessed the well. On the next morning women came as usual from the other village to fetch water. But the inhabitants of the first village turned out and refused to allow them to approach, on the grounds that Bhowani was among them and would be angry at being disturbed. The inhabitants of this second village had to get their water elsewhere, and consequently came into the town to make a complaint. It may be noted that the official to whom they chose to bring their complaint was not the native prime minister or the native secretary for home affairs, or any other native official, who might be supposed to be better able to sympathise with their wrongs, but the head stableman, who was the only English official in the district at the time. I have no doubt that he pointed out to them that if they could not get their water, they were equally unable to get the cholera through this source.

Granting that the spread of cholera is chiefly furthered by human intercourse (and this at the present time few people seem inclined to doubt), it appears to me difficult to see how cholera could spread if these simple rules were rigidly enforced.

But there are other ways of avoiding the wrath of Bhowani which appear to me to be only slightly less admirable than those above mentioned.

Firstly, they say that Bhowani will be angry if any one takes medicine when cholera is about. Perhaps I owe some apology to medical men in suggesting that this rule is good. But when it is considered that if the natives were willing to take medicine, they would often have to walk twenty miles to the dispensary to get it, thus increasing the risk of spreading the disease through the four thousand villages that are in the district in question, it will be seen that there are advantages in the plan. Further, it would often happen that the medicine would arrive too late to have any effect on the patient, and probably it would have a bad effect on the relatives in making them doubt the efficacy of English drugs. Cholera in this district often kills in a few hours, and when a fairly unanimous choice has been made as to which of the thousand and one now existing remedies is most likely to be able to cope with it, it will be time to object to the custom in question. The wish to do something when one sees a fellow creature in pain is very natural. I saw an old woman dying of cholera in Dhusaha. The sole treatment to which she had been subjected was that a mud plaster had been spread over the stomach, and small doses of holy water from the Ganges were being poured into her mouth. The latter treatment was intended as a medicine for her soul rather than for her body, as every Hindoo should, according to the prevalent belief, drink this water before his death. Her relatives were too troubled by the occurrence to object to my putting some salol which I happened to have with me into this water, but it certainly did no good to the patient, and had I at the time known more about their religion, I should have avoided the risk of hurting their feelings.

When Bhowani is in the village, it is also necessary to avoid feasting and other forms of indulgence. The excellence of these rules is sufficiently obvious.

What is the origin of this worship of Bhowani, every detail of which, excepting the sacrifices, appears to be a sanitary precaution? Is Bhowani the name of some primeval bacteriologist, who has since been deified? Or of some early sanitary commissioner, whose studies on the nature of cholera have since earned him a place in the Hindoo pantheon? Or, on the other hand, has the form of worship arisen by some process of evolution from a simpler and

perhaps less admirable model? *A priori* the latter alternative would appear to be the most probable, and it agrees the better with some inquiries I have instituted since my return to Agra. Bhowani is another name or incarnation of the goddess Kali.[1] There are not many worshippers of the goddess in the parts of the North-West Provinces with which I am acquainted. They occur more frequently, however, in the neighborhood of Calcutta; and here I made inquiries. I found, however, no trace in her worship of the above-described sanitary precautions. After some search, I met in Agra with a most devout worshipper of Kali, who had given up his business in order to be able to devote his time to religion. He showed great willingness to tell me everything connected with the ritual, and further gave me free permission to chop off his head if he could not stop a cholera epidemic by offering sacrifices and prayers. He was, however, more shocked than interested in the ideas of his fellow religionists in Balrampur, and I found in his worship of Kali no trace of any hygienic precaution. He told me that if cholera is present in a village, it is necessary to sacrifice to Kali every day, and that while the public worship, which may last about two hours, is going on, it is necessary that no one of the inhabitants of the village should stay away. Further while the worship is proceeding, the inhabitants do not like strangers to come into the village and interrupt them, either by drawing water or in any other way. It would seem that, in Balrampur, it is these details of the ritual that have been more developed than they are elsewhere. In other places the worshippers of Bhowani or Kali seem content with enjoining that the inhabitants should remain in the village during the two hours during which the religious ceremony is going on. In Balrampur, on the other hand, it is considered necessary that every one of the inhabitants should remain in the village during the whole of the twenty-four hours. Elsewhere the worshippers merely object to their service being interrupted. In Balrampur they object to strangers coming into the villages at any time when cholera is present, as if the worship were proceeding continuously.

I have left to the last a curious custom, rather than a religious observance, which is met with in the Balrampur district. It relates to the disposal of the dead. The body of a person dead of cholera, instead of being burnt, is buried. This may appear at first sight to

[1] Kali is the Destroyer. Diseases and pestilences are caused by her emissaries. The views of the Thugs were that they could please her by acting as her emissaries. Consequently they regarded the murder of their fellow creatures as a religious act.

be an unsanitary proceeding. But in reality it is the reverse. Usually the bodies of Hindoos are burned. It is a necessary part of the ritual that on the fifth, tenth, eleventh, or thirteenth day after the burning, according to the caste, all the relatives of the deceased should meet in his house with as many Brahmins as can be obtained, and that they should have a feast. Supposing this to be done at a time when cholera was present in the village, there can be no doubt that it would lead to the diffusion of cholera over the surrounding district. A case in which this appears to have happened is mentioned in a recent report by Surgeon-Captain Pratt on cholera in the Gonda district. The worshippers of Bhowani, on the other hand, prefer to bury the bodies until cholera has vanished. The burying of the body is not followed by the assemblage of the relatives for the funeral feast, but after the cholera is over they dig up the body, burn it, and then carry out the religious ceremonies. I cannot find that this apparently unsanitary proceeding has ever re-started the cholera. Nor is it likely that it should, for it has recently been shown that the cholera microbe rapidly perishes in buried corpses. How far this disagreeable custom may be objectionable in respect of other diseases I am not prepared to discuss, but I have little doubt that it tends to prevent the spread of cholera.[2]

As already stated, my object in coming to Balrampur was to disinfect wells, and my proposal to do so had been met by a direct negative on the part of the Dhusaha villagers. After learning their belief as to the nature of cholera, and the nature of their objections to the presence of a disinfectant in their wells, I was in a position to attack them again on the subject. Knowing that it is more easy to convince people by education than by argument, I collected about a dozen jogis and other kinds of fakirs and some Brahmins, and gave them a lecture which, with the accompanying experiments, lasted about two hours, and was completely successful in its object. Those who know fakirs chiefly, as I have seen them, hanging for hours head downwards, over a hot fire in the burning Indian sun, or attempting to earn their salvation by other eccentric methods, such as sitting on a bed of upturned nails, may think that I was too

[2] In many parts of Oudh it is a custom to throw the bodies of persons dead of cholera into rivers. In other parts of the country this fate happens to the bodies of persons dead of snake-bite. Still more widespread is the custom of disposing of the bodies of lepers in this way. For this I believe there are religious reasons. The bodies of young children are not cremated. In the case of poor people the cremation is often very partial, and the greater part of the disintegration is left to the sacred turtles which are always waiting at the burning ghats.

sanguine in hoping to succeed, and a short account of this lecture may therefore be of interest.

I commenced my lecture by showing them a human hair under the microscope, first slightly magnified, and then under increasing degrees of magnification, until, as they affirmed, it looked as large as a tree. Then I showed them some mildew growing in a test tube; this they recognized. Then, under a low power of the microscope, they saw that the mildew consisted of a mass of threads. Under a higher power (a magnification of 750 diameters) they recognized with evident interest that it was a plant, and they themselves pointed out the branches, the roots, the flowers, and the seeds. I then showed them a large collection of microbes which I had at that time collected from different wells in the neighborhood. In each case I gave the name of the well in the hope of increasing their interest in the subject, and with the *arriere-pensee* of suggesting that their water was in need of improvement. The first microbe which I showed them was a large bacillus, that had grown out into long rods similar in thickness to the threads of which the mildew consists, and containing rows of spores which they recognised as seeds. I then showed them the same bacillus at an earlier stage of its growth, when the individual rods were shorter and slowly moving through the culture liquid. The next microbe I exhibited was still smaller and rapidly motile. The last was the smallest, and moved so quickly across the field of view that they could only see it with difficulty. This was the cholera microbe. I told them that it was the army of Bhowani, but afterwards referred to it as the "cholera mildew." I pointed out how in some respects these creatures resembled plants, in others animals. Since they had seen them moving, it was no use asserting that they were merely plants, so I contented myself with asking the question, "Who can tell which they are, animals of plants?" I then told them that the food of these creatures is dirt. I showed them some peptone under the name of the "essence of dirt taken from the inside of a pig." The nomenclature may appear strange, but if I am right in believing that peptone is usually made by allowing a pig's stomach to digest itself at a warm temperature, it at least cannot be described as highly inaccurate. I then showed them some water to which some of this "essence of dirt" had been added. I told them the name of the well from which the water had been taken, and explained that on the previous night the cholera mildew had been present in such small quantities, that I was unable to see it by means of the microscope,

but that owing to the "essence of dirt" having acted as food, the water now looked as if milk had been added to it, and the reason of this was that many thousands of the cholera mildews were now present in every drop. It may be explained that the addition of peptone to water in this way is the ordinary method of testing for the cholera microbe.

I then somewhat changed the subject by asking why it was that no one ever got cholera by drinking holy water, whereas many persons died of cholera every year by drinking water out of ordinary wells. Holy water, it may be explained, is water taken from the Ganges or Jumna.[3] Many bodies of persons dead of cholera are thrown into these rivers. Natives constantly drink the water of the river while cholera corpses are floating past, yet none of them contract the disease from so doing. Yet it is certain that the cholera mildew gets into the water. Further, this must also happen when cholera breaks out at religious festivals at Hurdwar and Allahabad; yet there is no evidence that cholera spreads to villages downstream more quickly than it does to other villages, to which it is carried by the returning pilgrims. I suggested that the reason of this is that the water of these rivers contains no dirt suitable for the cholera mildew. Consequently, when it gets into these rivers it quickly perishes owing to lack of nourishment. The water of these rivers appears to be muddy. If some of the mud floating in their water is examined under the microscope, it is seen to consist of nothing but little pieces of stone. If the mud from a well on the other hand, is examined, pieces of leaves, of clothes, of human skin, and of other particles of animal origin may be discerned. Such things furnish food for the cholera mildew. Consequently, if a trace of the cholera mildew gets into one of their wells, finding there a suitable food, it rapidly reproduces until the cause of cholera is present in quantities in every drop. Here in Balrampur the wells were dirty, and hence cholera came and was bad every year. In Agra, on the other hand, where I came from, the wells were cleaner and cholera was far less frequent.[4]

I then went on to ask how cholera could be stopped. This could be done by adding to the wells a medicine which I possessed, which

[3] Evidence of the extraordinary purity of the Ganges and Jumna may be found in a paper which I read at the Indian Medical Congress in Calcutta (December, 1894), entitled "On the Microbes of Indian Rivers."

[4] I have stated some of the grounds on which this and other opinions expressed here are based in *The Annual Report of the Chemical Examiner and Bacteriologist to the Government of the North-West Provinces and Oudh* for 1894, published at the Government Press, Allahabad. But since writing the above, I have been led to the view that there is something in the water of the Ganges and Jumna which kills the microbe.

had the wonderful power of destroying dirt. The medicine, it may be explained, was potassium permanganate. To exhibit its action, I placed before them two glasses of water. To one I added a small quantity of the "essence of dirt." The other was pure water, or, rather, the best that I could obtain. I showed them some potassium permanganate, dissolved it in water, and added a few drops of the solution to each of the glasses. The purple color produced by the addition remained permanent in the glass containing clean water; but in the other, owing to the presence of the peptone, the color was destroyed in a few seconds, giving rise to a yellow color; and presently a brown precipitate was deposited. I pointed out to my audience that where dirt was present the medicine had combined with it. The medicine was destroyed, and also the dirt, both falling to the bottom as a precipitate. I pointed out that this might be done in a well just as easily as in a glass, and that by so doing they inevitably render the water less fitted to support the life of the cholera mildew, and make the water like that of the Ganges.[5] I did not ask them to take away the life of any living creature, for this I knew was contrary to their religion; but I did ask them to remove its food and thus prevent this living creature from reproducing itself, and so giving them the cholera. Further, I said that I knew that drinking an English medicine was also contrary to their religion, and I did not ask them to drink it. There was plenty of dirt in their wells with which it would combine, and if they added it at night, it would, before the morning, have fallen to the bottom. Further, as they could see for themselves, if a trace of the medicine was present in the water, it produced a purple color, and therefore if they waited till the purple color had disappeared, they would be safe to avoid the chance of swallowing the medicine.

Whether they were most impressed with the cogency of my arguments, or the exceeding badness of the Hindustani in which I expressed them, or by the price of my microscope, I do not know; but they appeared to be satisfied that it was a good thing to add the medicine to the wells; some of them even appeared to be eager to do so, since cholera was in their villages.

After giving this lecture I went to Dhusaha, and at last persuaded the chief jogi, Mahadeo Purhit by name, to allow me to put medi-

[5] Some evidence that permanganate really acts in the way here described—namely, by removing the food of the microbe and thus "starving it out"—was subsequently obtained in an epidemic of cholera in Shahgunj. Here the cholera microbe vanished from the well water a few hours after the addition of the permanganate, but reappeared on the following morning. But within three days it had wholly disappeared from the wells which had been treated, though it continued to exist for weeks in other wells that had not been medicated. Less than two ounces of the permanganate had been added to each well.

cine into his well. The natives crowded round, showing much surprise at the quantity of color produced by so little of the substance. The addition was made at evening, and on the next day both the color of the permanganate and the cholera microbe which had previously been in the well had completely vanished.

Later in the day news was brought to me that Mahadeo Purhit was dangerously ill. I hurried over to see him, and to my dismay found that he was dying of cholera. In the afternoon he died. I went again immediately to the village, not feeling very sure of the reception I should get, since it was inevitable that, sooner or later, the inhabitants would come to the conclusion that his death was a judgment from Bhowani for his allowing a Sahib to come into the village and to put medicine in his well. However, I thought that it might be possible to prevent their arriving at this conclusion by first getting another idea into their heads. I spoke to the villagers, and pointed out that his death proved the truth of what I had been saying, for I had said that the cause of cholera was in his well at a time when no one who drank its water was suffering from the disease. Now he had died from drinking this water. If I had put the medicine into the well a week earlier, he would now have been all right. I then seized the opportunity of making some prophesies about other wells which were in the village, and in which I had found the cholera microbe; and without more ado the villagers allowed me to put permanganate into all these wells.

It may be noted that it was most important that the villagers should have no objection to this medication of their wells. For if they did not approve of it, they might obtain their water from a tank or some other source which might be worse than the well itself. Although I succeeded in showing the natives that the addition of this medicine implied nothing dangerous to their caste, I could not help their being at first a little frightened of it. So I drank some water (and this was the second of the two occasions only on which I have drunk water since I have been in India) from one of the wells in the village, to which permanganate had been added; this I had to do in order to convince the natives that it was not poisonous.

The cholera stopped within three days of the treatment of the wells, that is to say within a time covered by the probable incubation period of the disease. It is not the object of this paper to prove that the disinfection of wells during cholera epidemics is useful, so

I will confine myself to saying that the results obtained in other epidemics as in this have been encouraging, but not conclusive, as to the value of the method.

I wish rather to suggest that a help to progress in sanitation in India may possibly be secured by studying the customs of the people in the light of recent knowledge, and by encouraging those which appear to be of use. The customs above described exist, so far as I am aware, over a limited area only, and from the standpoint of others than the inhabitants themselves, this religion which makes quarantine in the presence of cholera one of the cardinal virtues, is little more than an ethnological curiosity. In other parts of India the religious beliefs of the people impel them to the most unsanitary actions, especially at their religious festivals, which are known to be so potent in spreading diseases.

But I have come across customs which exist over a far wider area, and which I believe to have a beneficent influence in limiting the spread of epidemic disease. Take for instance the customs connected with giving water to strangers. I have been told that in some districts Brahmins keep a bucket and rope at each well for the special use of travellers, these not being allowed to lower their own buckets into the well. In other places a man also is provided to draw water for strangers. Sometimes, in the case of villages situated near to the high road, a man brings water from the village to sell to the passers by. But I believe a more frequent plan is for the villagers to subscribe, and to keep going a house in which passers-by can obtain water free of cost. A man of high caste sits inside the house at a little window. A traveller comes up and asks for water. In England he would receive it in a glass which he would put to his lips, and after having deposited on the edge of the glass any objectionable microbe which he might happen to have about him, whether influenza, diphtheria, or whooping cough, would return the glass in a condition in which it might possibly be ready to infect the next comer. In India the simple process of giving a cup of cold water to a traveller is carried out with more regard to sanitary laws. Firstly the traveller states his caste. If he is of high caste, immediately he holds out his hands, and washes them with water poured into them. Then more water is poured into his hands and thus conveyed to his mouth. If by any chance he should happen to touch the drinking vessel, it would be necessary to heat it in a fire to sterilise it, or, as the natives say, to remove the defilement, before it could be used again for the next comer. Supposing the

traveller is of low caste, that is to say one engaged in some filthy occupation, then the water cannot be poured direct from the vessel into his hands, because, as was explained to me by a Brahmin, it is possible that some defiled water might splash back from the man's hands on to the vessel. Hence the low-caste man has to drink from a little spout called a "tonti," usually made of bamboo, projecting from below the window. The water-provider pours water from his vessel into a sort of funnel. Thence it issues by the spout, and if any water does splash back from the man of dirty occupations, it merely falls on to the spout, and there is no risk of its infecting the water supply for the next comer. If one realises the complete absence of the dirt-fearing instinct, among, for instance, the sweepers, and the fact that it is their business to remove the most filthy offal, which they generally do with their hands, and that consequently their hands are liable to be polluted with the most objectionable microbes, it will be understood that the above precautions are by no means a useless refinement. When I was examining one of these places the water-provider offered me a drink, adding that he had a glass. When I reflected that I had only just recovered from a mild attack of cholera, owing to an infection contracted in my laboratory from a moment's carelessness, I felt more inclined to drink from the spout than to run the risk of infecting his water by drinking in the English fashion.

It is now abundantly proved that the cholera infection is often carried into villages by returning travellers. There can be no doubt that it then infects others by the intermediary of the village well. In reading certain reports which contained much evidence in favor of this statement, I was struck by the fact that the traveller in each case appears only to have brought the disease to the village to which he returned, but does not seem to have deposited the infection in the villages through which he passed. There is the possibility that this, if true, is due to the above described arrangements for giving water to strangers. This inference, however, cannot be made with certainty until investigations have been made, both as to the customs in the villages in question, and as to the amount of cholera in villages situated on the high roads. Against this idea may be stated the fact that cholera is known to be frequent along great pilgrim routes. But it is possible that this is an exception which helps to prove the rule. Owing to the vast numbers of pilgrims passing along the roads, it would, I suspect, be impossible

for the villagers to provide water for them all to drink, and it thus becomes necessary for them to draw it for themselves.

I have had opportunities of watching the customs of these pilgrims at the large religious festivals held annually near Allahabad, at the point of junction of the Ganges and Jumna. For miles along the roads leading to the fair, and all over the plain near the site of the fair, families of Hindoos (chiefly Brahmins) can be seen encamped, and cooking their simple food. Before eating they take off all their clothes, except a loin cloth, and wash themselves all over, for fear some defilement may be present on their clothes or bodies. As is well known, they object to a person of another caste coming near to them while they are eating. It is not so well known that they have no such objection if their food has been heated to a temperature sufficient to kill microbes, that is to say, if it has been fried in oil, except so far as persons are concerned who belong to the five lowest castes. The occupations of members of these castes are regarded as unclean, and they are not allowed to come near high-caste Hindoos while they are eating under any conditions, neither are such persons allowed to bring the uncooked food of Brahmins from the bazaar. It is obvious that each one of these rules has a tendency, though it may be slight, to prevent men of higher caste from swallowing the microbes which can cause disease. Unfortunately, when at pilgrimages, they do not appear to pay much attention to the precautions which at that time are most required. I questioned several of them on that point, and they told me that they took no care as to what water they drank. I may parenthetically remark that I was walking alone among these natives without any imposing array of police or other officials. The only sign that I was an official was the doubtful one that I was carrying a note-book. Yet frequently as I passed the natives would turn round and call out after me, "God bless the power and property of the English government." I was particularly struck by their using the term "English," and I commend the fact to the attention of the members of the National Congress.

Sometimes the customs attending pilgrimages are fearfully unsanitary. For instance, at the site of a pilgrimage in the Madras Presidency is a hill which is supposed to be a god. It is surrounded by twenty-four small tanks. On the great day of the festival nearly a hundred thousand persons bathe in and drink the water of each of these tanks. Each tank is thus defiled by everybody, since, for religious purposes, every one must go round the hill and

bathe in each of the tanks. Little wonder that these pilgrimages are potent means for the spread of cholera.

The idea that natives in certain parts of India, when in their villages, habitually take precautions to insure the purity of their water supply may seem strange, not only to English readers, but also to Anglo-Indian officials stationed in certain other parts of India, where no such care is taken, as, for instance, is, I suppose, the case in localities where the supply of drinking water is derived from tanks. Here, I am informed, the natives are in the habit of washing themselves, their cows and the Sahib's shirts in the tank that also acts as the village cesspool and the village water supply. Personally, I know nothing of these parts of India. The following account is based on experience obtained near Agra and in other parts of the northwest provinces.

In every village at least one well is reserved for the supply of drinking water. Only vessels especially reserved for the purpose are allowed to be lowered into such wells. Great care is taken to preserve the drinking-water vessels from pollution. Mussulman water-carriers or bhistis[6] do not allow any one but themselves to touch their water buckets or the skins in which they carry their water. Hindoos generally draw water in an iron vessel known as a "dol." This is only used for drawing the water. When required the water is poured into another vessel, and only from this other vessel is the water poured into the hands of any one requiring a drink. No one is allowed to go onto the platform of a well without removing his shoes.

Other wells in the village are reserved for household purposes. The vessels used to draw drinking water are never allowed to be lowered into these wells by Hindoos. I suspect that Musselman bhistis are not so particular; at any rate this is the case with bhistis employed by English people. The poorest Hindoos have two separate sets of vessels, one to hold drinking water, the other for water used in household purposes, such as washing the cooking vessels.

Houses, being generally made of mud, are constantly in need of repair. The workmen (or coolies) who need water for carrying out this work necessarily employ very dirty earthenware vessels. I am certain that these are not allowed to be lowered into drinking-water wells, and I believe they are not allowed to be lowered into wells used for household purposes. A small tank containing dirty

[6] Bhistis are always Mahommedan, and only draw water for Mahommedans or for English people. Hindoos usually draw water for themselves, but sometimes water-drawers are employed. These are always of Brahmin or Cahar castes.

water is generally attached to each well, and from this the workmen take the water which they need in repairing houses. When first I saw these tanks I thought it was rather unsanitary to have such dirty water so close to the well. But the above statements, I venture to think, make it obvious that it is better to have such tanks than that coolies should lower their dirty vessels into a well used for drinking purposes.

I once asked a completely uneducated native why it was necessary to have dirty wells in the place, why the dirty wells could not be closed and all the water, whether for drinking or household purposes, be obtained from clean wells. His answer was that if this were done diseases would become prevalent. Whatever truth there may be in this answer appears to me to depend on the practical necessity that in some cases dirty vessels have to be lowered into wells; and hence it seems to be a good plan, as things go, to reserve some wells into which alone such vessels may be lowered.

I recently had to do with a cholera epidemic, in which certainly most of, possibly all of, the infection was derived from wells used for household purposes, and it is probable that the disease would have been far more widespread if the water of such wells had been actually drunk by the mass of the population. The epidemic[7] in question occurred in Shahgunj, and at the time it was stated to be inexplicable on the grounds that only women had been attacked. I found that the latter statement was true so far as the first part of the epidemic was concerned. The women who were affected had no supply of drinking water in common. Some of them obtained their drinking water from a well situated a couple of miles away from their houses. But out of seven cases I found evidence that six had been in the habit of going to one well, which was used, not for drinking, but only for household purposes, and consequently was chiefly frequented by women. A few poor Musselmans, however, were in the habit of using the water for drinking purposes. Hindoos used a better well situated about sixty yards away. The epidemic affected twenty-six Mahommedans and only one Hindoo. I have little doubt that the first part of the epidemic was due to accidental infection from the water brought by the women for household purposes. In the latter part of the epidemic the cholera microbe appears to have spread to other wells in the place; but in these cleaner wells the microbe seems to have assumed a less viru-

7 Some details concerning this epidemic will be found in my Annual Report already quoted.

lent form, for the cases which now affected both men and women in nearly every instance ended in recovery, and on my putting disinfectants into the wells the epidemic ceased.

It is commonly supposed that the natives are in the habit of washing their clothes and themselves at the wells, and that the water frequently runs back into the well. This is not quite accurate. Women generally wash themselves either in their houses or in the river, if one is near. Men wash themselves and also their dhoti or loin cloth at the wells, and owing to the platform of the well sloping away from its mouth, very little water, if any, gets back into the well, provided it is in good repair. Clothes, both of men and women, are washed by dhobies, who are never allowed to carry on their business near a well. They are obliged to use either the river or a tank. It is considered that the occupation of dhobies is unclean and consequently they belong to one of the five lower castes who are not allowed to come near a well used by higher castes.

Perhaps the most interesting precaution taken by Hindoos about their drinking water is that those who are supposed to be engaged in dirty occupations, or vessels belonging to such persons, are not allowed to come near a well. In towns and larger villages it sometimes happens that a well is especially reserved for the use of Chamars and sweepers. More generally, if a sweeper wants water, he has to sit down at a distance from the well and wait till some one of higher caste comes and draws water for him.

This does not exhaust the list of precautions taken by natives in this district to insure the purity of their water supply. I was astonished to discover that they take pains to prevent the contamination of the River Jumna. While staying the other day in a bungalow in the Ram Bagh Garden, which is situated above Agra on the banks of the river, a fisherman came to me and complained that my servants had dug a drain from the cook house, and that from it dirty water was running into the river. The servants had made this drain by my orders, as I had a prejudice against the accumulation of stagnant water near to where my food was being prepared. On the fisherman making the complaint I hazarded the statement that it did not matter, since all up the banks of the river everywhere the natives were in the habit of depositing on its banks, as they often did at the margin of a tank, refuse which frequently fell into the water. The fisherman somewhat indignantly denied that this was the case, saying that men who would do such a thing must be of very low caste, and that higher caste people certainly always took

pains to prevent the pollution of the river. To this I objected that the natives did not care whether the water was dirty or not, because a mile or two lower down the stream they were bathing at the ghats just where a large drain ran into the river. The fisherman admitted that they did this because their ancestors had always bathed there, but at the same time he said they do not like the drain being run into the river, because the river is holy and they make many prayers to it. It appears to me that this incident well illustrates to what extent with these people cleanliness is godliness, and tends to make one regret that cleanliness has not been left a matter of common sense, instead of having become incorporated with their religion.

I have only attempted to describe some of the customs of the Hindoos in respect of their supply of drinking water. A further study of their customs would show that, with the higher castes of Hindoos, cleanliness and the avoidance of defilement are virtues to be cultivated in one's self and admired in others. Among the poorer classes and among men of lower castes these hygienic virtues are apt to be tempered with much original sin of the unsanitary kind. But it cannot, I think, be denied, that even when only a few members of higher castes are present in a village they exert a beneficial influence in preserving the supply of drinking water from contamination. Unfortunately, their influence does not go far enough, but it appears to me that this is only a reason for trying to extend it in those directions in which it appears likely to be of use.

The above remarks may seem like a eulogy of the caste system. This is far from my wishes. A system which enjoins that persons who are careful in avoiding defilement should be admired and respected, but not imitated, at any rate by part of the population, is far from satisfactory even from the hygienic standpoint. From the ethical standpoint, a system which tends to keep certain classes in a low position and to prevent them form rising to anything higher, no doubt leaves much to be desired. Further, it seems to make no distinction in importance between matters which might be of great use, such as those relating to the water supply, and those of trivial import, such as the position of the cooking vessels while food is being prepared.—*The Nineteenth Century*, October, 1896.

Blood Purifiers and Nerve Tonics.—The chemist of the Massachusetts State Board of Health has made an analysis of ten of the most popular "nerve tonics" and "blood purifiers," and has found them to contain from 7.9 per cent to 26.2 per cent of alcohol.

SAND FILTRATION.

A PRACTICAL PLAN FOR THE PURIFICATION OF THE PHILADELPHIA WATER SUPPLY.*

By Allen Hazen, C. E.

Explanation by Mrs. Scribner, President of the Woman's Health Protective Assbciation:

"The Woman's Health Protective Association has always considered the question of a pure water supply for Philadelphia the most important matter before her citizens to-day. Our reasons for this are two-fold—first, because with a true love for our city and a desire to see her content with only the best, we feel that the condition of our present water supply, liable as it is to be blackened with coal dust or rendered yellow with mud, and always contaminated by the drainage from the six large communities situated on its banks, containing a population of 350,000 human beings, besides the cemeteries and large manufactories whose drainage is pumped almost directly into our reservoirs, is more befitting a primitive African tribe than a great and splendid municipality.

"Our association found, by practical experience, that although some methods of filtration are well known and the facts about them easily obtainable, there is one method adopted in nearly all the large cities in Europe about which people generally do not seem to be well informed, and so last June the Board of the Health Protective Association decided to engage Mr. Allen Hazen, C. E., of Boston, an engineer of known ability and prominence, to come here to Philadelphia and study the actual conditions and to report to our association the practicability of this method of filtration for Philadelphia. The report which I hold in my hand is the result or his summer's work. How well he has accomplished his task I will leave to yourselves to judge.

"It now becomes my pleasant duty on behalf of the Woman's Health Protective Association of Philadelphia to present this report to the Mayor, and through him to the director of Public Works, for the use of the city, with the earnest hope that it may be of service in throwing some light on this very difficult problem."

*Report to the Woman's Health Protective Association concerning "a practical plan for sand filtration as a means of securing a better water supply for the city of Philadelphia."—September 18, 1896.

MR. HAZEN'S REPORT.

Mrs. John H. Scribner: In accordance with your instructions, I have examined the water-works system of Philadelphia to determine whether or not it is feasible to purify the water of that city by means of sand filtration as commonly practiced in Europe, and without the use of alum or other coagulants, and if so, to determine as nearly as may be what cost would be thereby involved.

I wish to acknowledge at the outset my very great obligation to Mr. John C. Trautwine, Jr., Chief of the Water Bureau, who has placed the resources of his office at my disposal, and without whose co-operation this report would have been impossible. I am also indebted to Mr. Amasa Ely, his assistant, for personal attention in examining the various grounds mentioned in this report, and to other gentlemen of the Water Bureau for their uniform courtesy and attention in furnishing maps, statistics and data at their disposal. The question of filtering the water supply of Philadelphia has already been considered at the direction of your Association by Joseph B. Rider, C. E., who presented a report thereon dated April 29, 1895. Mr. Rider advocated the adoption of some form of sand filtration, but was inclined to favor a plan somewhat at variance with the most approved European practice.

In the short time available for this examination it has only been possible to make a superficial examination of the problem sufficient only to determine the feasibility of the general process suggested; and this report, so far as it relates to particulars of arrangement of works, etc., must be considered as suggestive rather than in the nature of definite recommendations.

This is particularly the case, as the whole subject of future water supply for Philadelphia was most exhaustively considered by Mr. Rudolph Herring, an engineer of great eminence and ability, during the years from 1883 to 1886; and as a result of his studies he recommended to the city the introduction of water by gravity from upland sources, supplemented by water pumped from the Delaware river from a point above the most serious points of pollution. Mr. Herring did not consider at length the filtration of the present sources, as he did not consider the then existing evidence as sufficient that filtration would adequately purify such waters. The additions to our knowledge of the nature and results of filtration during the last ten years have materially changed the aspects of the case, and Mr. Herring has himself indicated that if he were reconsidering the subject he would give serious attention to the filtration of the present supply.

The advantages of a gravity supply from upland areas, where the water is not subject to pollution by sewerage, are very great, and the project recommended by Mr. Herring is not to be put lightly aside to make room for the latest ideas concerning the purification of polluted waters obtained from sources near at hand, and you will thus readily understand that it is impossible for me at this time to recommend the adoption of any system. I have simply canvassed the ground in a preliminary way to determine the possibilities of filtration.

In case the city should take the matter up it would be desirable and necessary to have the various localities suggested surveyed and examined by test pits, and to have plans prepared for the various works involved. It would probably be found upon further study that the general plans here suggested could be modified with advantage in many important particulars, and a plan could be worked out which could be taken as representing the most favorable system of filtration. This plan should then be compared with the plan recommended by Mr. Herring in all its phases, taking into account changes in the cost of construction and of the interest to be paid for borrowed money, etc., which may have occurred in the ten years since Mr. Herring's report; and it would only be after such a comparison, which is quite beyond the scope of the present report, that a reliable opinion as to the expediency of the introduction of filtration could be given.

PRESENT SOURCES OF SUPPLY.

The city of Philadelphia now derives its water from the Delaware and Schuylkill rivers, 94 per cent being taken from the Schuylkill and 6 per cent from the Delaware. The Schuylkill above the intakes has a drainage area of 1,900 square miles, and the population upon the watershed above Philadelphia in 1890 was about 350,000, or 185 per square mile. The most important points of pollution are as follows:

Town	Population. (Census of 1890.)	Distance above intake. (Queen Lane.)
Conshohocken	5,470	8 miles.
Norristown	19,791	12 miles.
Phoenixville	8,514	23 miles.
Pottstown	13,285	39 miles.
Reading	58,661	60 miles.
Pottsville	14,117	103 miles.
Total	119,838	

Urban population on watershed, 63 per square mile.

An effort is now being made to treat and purify the sewage of Reading before its discharge into the river; but there is no assurance that this treatment as yet is adequate. Aside from Reading all sewage produced upon the watershed is discharged directly into the streams.

The water from the Schuylkill for Philadelphia is pumped from two pools formed in the river by dams within the limits in the city. The sewage from portions of the city was formerly discharged into these pools. An intercepting sewer has been constructed which takes sewage to a point below a dam below the lowest pumping station. The district sewered by this intercepting sewer is sewered by what is known as the separate system. That is to say, the rain water and sewage are removed by separate systems of carriers, and I am informed that little, if any, sewage is discharged from the city sewers at any time into the river above the intakes. The river banks above the city limits, and the west side of the river, where the latter forms the boundary, directly opposite the city, are occupied by manufacturing establishments discharging directly into the river.

The use of water from the Schuylkill at the present intakes has been regarded by every competent authority investigating the subject for many years as most objectionable, and the use of water from such a polluted source should be abandoned at the earliest possible moment.

The Delaware River is tidal as far as Trenton. The rise and fall at the intake is said to be about six feet. Most of the city sewage is discharged four miles or more below the intake, but Frankford creek, only one mile below, receives a large amount of sewage which flows with it into the river, and a number of sewers serving local population discharge very near, and even above, the intake. It is thought that at ordinary stages of the river the flow is sufficient to prevent the tide from carrying sewage matters up stream for any considerable distance, but when the natural flow of the river is small the up-stream movement of the river must be considerable.

I consider it desirable that the intake should be carried far enough up river to be above the highest point to which considerable quantities of sewage from the Philadelphia sewers may be carried by the tide. Whether the present intake fulfils this condition or not could be determined by numerous float experiments, and particularly by repeated bacterial examinations of the water from

various points in the river, particularly at times of spring tide and of minimum flow of the river. Such examinations have not been made, but are desirable at as early a date as practicable, to determine the best location for works.

The Delaware River above the water works intake has a drainage area of 8,100 square miles, with a population in 1890 of about 600,000, or 74 per square mile. The most important places which may pollute the river are as follows:

Town.	Population. (Census of 1890.)	Distance. above intake. Miles.
Burlington, N. J.	7,264	11
Bristol, Pa.	6,553	12
Mount Holly, N. J.	5,376	15
Bordentown, N. J.	4,232	21
Trenton, N. J.	57,458	26
Lambertville, N. J.	4,142	41
Point Pleasant, Pa. (Point suggested by Mr. Herring as source of water for Phila.).		
Phillipsburg, N. J.	8,644	75
Easton, Pa.	14,481	75
South Easton, Pa.	5,616	76
Bethlehem, Pa.	6,762	86
South Bethlehem, Pa.	10,302	86
Allentown, Pa.	25,228	91
Mauch Chunk and E. Mauch Chunk, Pa.	6,873	121
Hazelton, Pa.	11,872	140
Port Jervis, N. Y.	9,327	140
Total	184,130	
Square miles of water-shed		8,100
Urban population per square mile		23

Aside from possible tidal pollution the Delaware River is much less polluted than the Schuylkill; its flow is greater; its water is softer; it is less subject to local pollution, and in every way it is more desirable as a source of water supply than the Schuylkill; and the same is equally true whether each of the waters are used in their raw condition, as at present, or if each of them should be filtered by equally good systems of filtration.

SITES FOR FILTERS.

In general topography the land upon which the city of Philadelphia is built rises gradually from the Delaware River. The Schuylkill River cuts through the highland back from the Dela-

ware, and has but a narrow valley. The various pumping stations upon the Schuylkill are surrounded by abrupt hills, and with but few exceptions there are no opportunities for the construction of sand filters near them. The exceptions mentioned are not important; for, while considerable quantities of water might be filtered upon land immediately adjoining the Queen Lane and Belmont pumping stations, the areas are inadequate for the filtration of the quantities which will be required for supplying the respective districts, and it will be better to establish filters at other points where all the areas necessary in the respective cases are available at one point.

While the river bottom furnishes no adequate sites for filters, such sites can be found upon the higher and comparatively flat land a short distance back from the river. In utilizing such sites the force mains from the pumping station would be taken to filters constructed upon land above and near the respective reservoirs and at such elevations as to necessitate as little extra pumping lift as possible. The water would be filtered and then drained from the filters into the respective reservoirs.

At Belmont an area of land a little higher than the reservoir is available great enough for all possible requirements. A part of this area is park property, while a part is agricultural land and could probably be secured by the city upon reasonable terms.

The Fairmount pumping station, with the Fairmount, Corinthian and Spring Garden reservoirs, are in a closely built up portion of the city, and are surrounded by lower ground, so that no suitable sites for filters are available in their immediate vicinity.

An area of land between Lehigh avenue and Clearfield street, and between Twenty-eighth and Thirty-first streets, and extending for a little beyond the latter, is owned by the city, having been purchased as a reservoir site. The reservoir, which was to have been called the Cambria Reservoir, has not been, and probably will not be, constructed, as the Queen Lane reservoir in a measure takes its place. The city owns 45 acres of land in this place suitable for filter sites and an additional area immediately adjoining it is now used for agricultural purposes and could probably be secured. Filters constructed upon this land could be reached from the Spring Garden pumping station, and also, if necessary, from the Queen Lane pumping station, and the effluent would be at a sufficient elevation to drain into the largest of the city reservoirs, the East Park reservoir. The land now owned by the city is sufficient to allow the con-

struction of filters with an effective filtering area of 30 acres with all accessories, and with a maximum filtering capacity of 90 million gallons per day, and with the purchase of other suitable land this capacity could be increased at least one-third.

Another available site for filters is found above the Queen Lane reservoir, where, without going beyond School lane and Wissahickon Avenue, an area is available sufficient to allow the construction of filters with an effective filtering area of 40 acres, and with a maximum capacity of 120 million gallons per day.

Still another and higher site for filters is available north of the new Roxborough reservoir. I have not maps to show the exact area of this tract, but it is certainly sufficient to meet any reasonable requirements for a long period of years. Along the Delaware at the Frankford pumping station, and for many miles above upon the river bank, there are excellent and ample sites for filters. To utilize these sites filters might be constructed in excavation below the level of the river, but it would probably be better to construct filters upon the natural river bank at an elevation of from 10 to 20 feet above tide water and to raise the water from the river by means of centrifugal or low lift pumps. The filtered water would then flow to the present pumping engines, and be pumped by them as at present, and, if additional capacity should be required, by others, to the various reservoirs, or directly into the pumping mains.

SYSTEM OF DISTRIBUTION.

I have not had time to study in detail the system of distribution in Philadelphia, nor is such a study essential to the direct purpose of this report. The following suggestions as to a revised arrangement of districts are based upon the report of the Bureau of Water for 1891, where a proposed future system is outlined.

The first or Belmont district comprises that part of the city west of the Schuylkill River, has an area of 21 square miles, and is supplied from the Belmont pumping station upon the Schuylkill River. The estimated population in 1890 was 100,000.

The second, or Roxborough district, is east of the Schuylkill River, and comprises that part of the city above an elevation of 165 city datum. It has an area of twenty-three square miles, and had a population in 1890 of 70,000, and is supplied from the Roxborough pumping station. At the present time the Roxborough pumping station is supplying a larger area and population because water is let down from it to lower levels; but as this involves pump-

ing of the water to an unnecessary height it will be desirable to shut off these lower areas and to supply them from the Queen Lane reservoir as soon as the latter is ready for full use.

The third, or Queen Lane district, comprises land on the east side of the Schuylkill more than 60 but less than 165 feet above city datum, but not including the higher parts of what may be called the Frankford district. This third district, which is in part, and will soon be entirely supplied from the Queen Lane reservoir, has an area of eighteen square miles, and its population in 1890 was 208,000. The remaining twenty-nine square miles of high land in the city, most of which is agricultural land, and having as yet only a slight population, need not be considered further at the present time.

The fourth district includes all that part of the city below the level of sixty feet, city datum, and is now supplied by the Fairmount and Spring Garden pumping stations, and from the Frankford pumping station (the latter including land up to a level of 90), it covers thirty-eight square miles and had a population in 1890 of 670,000. This is by far the largest part of the city, and is capable of being supplied either from the Schuylkill or the Delaware, or, as at present, from both. The three first mentioned districts, that is Belmont, Roxborough and Queen Lane, are much more readily supplied from the Schuylkill than from the Delaware.

The rather numerous high service districts, served by secondary pumpage, are not here considered, as securing a pure water at the primary stations involves supplying the same to all secondary systems dependent upon them.

To supply the district below 60, city datum, with filtered water it will be possible, as mentioned above, to filter the water from Spring Garden Station on the site proposed for the Cambria Reservoir, and to filter the water pumped at the present Frankford pumping station through filters in its immediate vicinity, or it may be better to go to a point further up the Delaware and construct a new pumping station and filters upon a site particularly adapted to them, and to pump the water from this point into the mains supplying the lower part of the city.

RESERVOIRS.

The City of Philadelphia is supplied with water from elevated reservoirs filled from the rivers by pumping. That is to say, the water pumped is carried direct to reservoirs, and the reservoirs are connnected with the system of pipes leading to the consumers. At

the present time there is an exception to this arrangement in that water for a small part of the city is pumped directly into the mains from the Spring Garden pumping station, but this is a temporary condition which will not be continued after the Queen Lane pumping station and reservoir are ready for full service.

The objects accomplished by these reservoirs are two-fold. First, they assure an abundant quantity of water at all times; and second, the storage improves the quality of the water supplied. In so far as they relate to quantity they serve to balance the fluctuations of consumption during the different hours of the day so that the pumps can be operated at a constant rate while the consumption fluctuates from hour to hour, and they also serve as a reserve to supply the city in case of breakage or other accidents to the pumping machinery or mains, or for use in case of unusual conflagration, or other excessive demands.

In so far as the reservoirs serve to balance the different rates of counsmption at different hours of the day (and this is one of their most important functions) the reservoirs at Philadelphia are very much larger than is necessary. The city has eleven considerable reservoirs with an aggregate normal capacity of 1,400 million gallons, equivalent to six or seven days' supply at the present rate of consumption. Several of the reservoirs, however, are not in condition for full service, and the actual quantity of water held in reserve does not exceed 1,000 million gallons, or five days' supply, while reservoirs with an available capacity of one-half of one day's supply are ample to balance the hourly fluctuations in consumption.

In regard to the necessity of maintaining so large a quantity of water for emergencies, it might be well to mention that the water works in many large cities, including such cities as Detroit and Indianapolis, are operated without any reserve whatever of this nature, the water being pumped directly into the mains as required, without storage. It is necessary in such cases to provide a pumping capacity considerably in excess of the actual maximum consumption, to allow for accidents to any of the machinery, and practical experience has demonstrated that with reasonable precautions it is possible at all times to maintain an adequate supply. As a rule, and within certain limits, additional pumping machinery is cheaper than additional reservoirs, and the advisability of maintaining so large reservoir capacity simply with reference to maintaining the quantity of the supply may be seriously questioned.

The second functions of the reservoirs, perhaps even more important than the first, is that of improving the quality of the water. All the water, with the above mentioned exception, is pumped to the reservoirs and it ordinarily remains in them for several days. During these days much of the mud contained in the water is removed by sedimentation, although after heavy storms the water supplied from the reservoirs is often very muddy; and, judging from the expeirence of other cities, and by tests of Dr. Bolton, of water from the East Park reservoir, the greater part of the bacteria also are removed, in part by sedimentation, and in part by death, as the conditions in reservoirs are not favorable for the propagation of pathogenic germs, and the larger the reservoir the greater the improvement thus effected. If Philadelphia had reservoirs many times as large as the existing ones, and was able to use them in rotation, it is probable that a reasonably pure, or even an entirely satisfactory, water could be secured from them, even from the present polluted sources, and if the reservoirs had been smaller than they are, the city would have suffered much more severely than it has from the evils of contaminated water. From this standpoint the ample reservoirs are extremely fortunate and none too large.

In case pure water is furnished by filtration or otherwise the conditions with reference to the city's reservoir will be radically changed. The water will not then be further purified in the reservoirs, and there will be no object in pumping all of the filtered water first to the reservoirs, but it will be quite as satisfactory to pump the water directly into the mains and allow it to go direct to the consumers. By connecting these mains with the present reservoirs it will be possible to operate the pumps at a constant rate, as it is always desirable to do. When more water is pumped than used, as during the night, the excess will go to the reservoirs, gradually filling them; while during the day hours of heavy consumption, when more water is used than is pumped, the excess pumped during the previous night will be available from the reservoirs to supply the deficiency. The reservoir capacity needed to maintain this service need not necessarily exceed one-third of one-half of one day's supply.

Algae growths, dependent upon sunshine, are much more abundant in pure water than in ordinary river waters, and, in case the supply is filtered, it will be a serious question whether it will not be desirable to cover the reservoirs by roofing or otherwise, so far as they are directly connected with the distributing system.

The necessity of covering would be equally great with any system of filtration; with mechanical filtration as much as with sand filtration. Lawrence and Poughkeepsie, supplying filtered water, use open reservoirs, but a certain amount of algae growths results. This growth is not particularly unhealthy, but it sometimes becomes disagreeable to the senses.

CONSUMPTION OF WATER.

The population in Philadelphia for 1895, assuming that the increase was at the same geometric rate as it was from 1880 to 1890, was 1,164,000, and the quantity of water pumped, as shown by the pumping records, was 77,819,013,610, or 212,760,673 gallons per day, or 183 gallons daily for every person in the city. In the report of the Water Bureau for 1895 is given a somewhat larger estimate of the population, and a correspondingly lower estimate for the consumption per capita, namely, 162 gallons. Whichever estimate is correct, it is only possible to agree most heartily with the present able chief of the Water Bureau, and with his predecessors, and with everyone who has seriously considered the matter in recent years, that this consumption is excessive and entirely beyond the reasonable requirements of the city, and it should and could be reduced at once by proper measures to a very much lower figure, probably one-half of the present consumption. It is often alleged that the increased use of baths and other domestic arrangements requiring water largely increases the consumption, and that the rapid increase of manufacturing operations demands large quantities of water, and that the increase in consumption is to be accounted for in these ways.

The most careful studies show, however, that even in the best class of modern houses, with the most liberal number of fixtures, with reasonable use of water the consumption does not exceed 30 gallons per capita or one-sixth of the present consumption in Philadelphia. The demands for water for manufacturing purposes, although undoubtedly larger than formerly, are inadequate to account for the alarming increase in consumption. This increase can only be accounted for by the deliberate or careless waste of water due to a wrong method of charging for the same.

Consider, if you please, what would happen to the city gas works if bills were collected according to the size of the house and the number of fixtures, the charge being the same whether gas was used in an economical and modern manner or whether every jet was lighted and allowed to burn all night and all day long, too, for

MR. HAZEN'S REPORT.

Mrs. John H. Scribner: In accordance with your instructions, I have examined the water-works system of Philadelphia to determine whether or not it is feasible to purify the water of that city by means of sand filtration as commonly practiced in Europe, and without the use of alum or other coagulants, and if so, to determine as nearly as may be what cost would be thereby involved.

I wish to acknowledge at the outset my very great obligation to Mr. John C. Trautwine, Jr., Chief of the Water Bureau, who has placed the resources of his office at my disposal, and without whose co-operation this report would have been impossible. I am also indebted to Mr. Amasa Ely, his assistant, for personal attention in examining the various grounds mentioned in this report, and to other gentlemen of the Water Bureau for their uniform courtesy and attention in furnishing maps, statistics and data at their disposal. The question of filtering the water supply of Philadelphia has already been considered at the direction of your Association by Joseph B. Rider, C. E., who presented a report thereon dated April 29, 1895. Mr. Rider advocated the adoption of some form of sand filtration, but was inclined to favor a plan somewhat at variance with the most approved European practice.

In the short time available for this examination it has only been possible to make a superficial examination of the problem sufficient only to determine the feasibility of the general process suggested; and this report, so far as it relates to particulars of arrangement of works, etc., must be considered as suggestive rather than in the nature of definite recommendations.

This is particularly the case, as the whole subject of future water supply for Philadelphia was most exhaustively considered by Mr. Rudolph Herring, an engineer of great eminence and ability, during the years from 1883 to 1886; and as a result of his studies he recommended to the city the introduction of water by gravity from upland sources, supplemented by water pumped from the Delaware river from a point above the most serious points of pollution. Mr. Herring did not consider at length the filtration of the present sources, as he did not consider the then existing evidence as sufficient that filtration would adequately purify such waters. The additions to our knowledge of the nature and results of filtration during the last ten years have materially changed the aspects of the case, and Mr. Herring has himself indicated that if he were reconsidering the subject he would give serious attention to the filtration of the present supply.

The advantages of a gravity supply from upland areas, where the water is not subject to pollution by sewerage, are very great, and the project recommended by Mr. Herring is not to be put lightly aside to make room for the latest ideas concerning the purification of polluted waters obtained from sources near at hand, and you will thus readily understand that it is impossible for me at this time to recommend the adoption of any system. I have simply canvassed the ground in a preliminary way to determine the possibilities of filtration.

In case the city should take the matter up it would be desirable and necessary to have the various localities suggested surveyed and examined by test pits, and to have plans prepared for the various works involved. It would probably be found upon further study that the general plans here suggested could be modified with advantage in many important particulars, and a plan could be worked out which could be taken as representing the most favorable system of filtration. This plan should then be compared with the plan recommended by Mr. Herring in all its phases, taking into account changes in the cost of construction and of the interest to be paid for borrowed money, etc., which may have occurred in the ten years since Mr. Herring's report; and it would only be after such a comparison, which is quite beyond the scope of the present report, that a reliable opinion as to the expediency of the introduction of filtration could be given.

PRESENT SOURCES OF SUPPLY.

The city of Philadelphia now derives its water from the Delaware and Schuylkill rivers, 94 per cent being taken from the Schuylkill and 6 per cent from the Delaware. The Schuylkill above the intakes has a drainage area of 1,900 square miles, and the population upon the watershed above Philadelphia in 1890 was about 350,000, or 185 per square mile. The most important points of pollution are as follows:

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MEDICAL EXCERPT.

By T. P. Corbally, A. M., M. D.

Gastro-Enteropathy. — M. Debone reported to the Academie de Medicine (*Gazette Hobdomadane*, September 27) on the communication of M. Clozien regarding the toxic nature of diseases known as Gastro-Enteropathies.

The communication describes a nervous condition which the author has observed in cases of gastro-enteropathy, and which he thinks depends on a toxemic condition. The attack comes on suddenly, more frequently during the day than at night. The patient feels a general sensation of numbness, and yet there is no distinct pain in any part of the body; there may be an extreme degree of lassitude with a sensation of unusual fullness or a feeling of emptiness in the head; or again he is bent down with headache and sacro-lumbar neuralgia; the breathing is difficult and to continue it requires a direct act of the will. In addition to all these, the circulation is retarded and consequently the functional activity of the whole system is diminished.

We have no objection to offer to this clinical description. The author has observed all these conditions in patients suffering with gastro-intestinal nervous affections. We see nothing but what is very natural in this condition, for the nervous disturbance of the stomach and intestines are very frequent in those suffering with nervous diseases, but the author makes the nervous phenomena described depend on the gastro-enteropathy.

We have a different opinion. It seems to us that gastro-enteropathy is only a partial phenomenon of the general nervous condition. He goes still farther; he supposes that the diseased stomach and intestines secrete a poison; that they give rise to a toxemia which causes the disturbances.

That is only a hypothesis which we cannot admit. Is it not more simple, more natural to say that the patients of M. Clozier were suffering with nervous troubles of various kinds, among which was that of the intestinal system?

Blood Rendered Imputrescible.—MM. Bosc and Delezenne of Montpellier have presented a very important communication to

the Academie de Medecene (*Gazette Hebdomadane*, September 20th), on the imputrescibility of blood that has been rendered incoagulable by the extract of leeches and the immunity that is contered by some substances that are classed as anti-coagulables.

In the course of experiments on the properties of anti-coagulating substances, we have been struck by the fact that the blood taken from an animal after an injection into the veins of an extract of leeches, may be preserved for a very long time without undergoing putrefaction. If a specimen of the blood which has been rendered uncoagulatable and a specimen of the normal blood of the same animal, be placed in a stove at 20 to 30 centegrade, and in the same conditions, putrefaction appears much later in the former specimen; the blood rendered uncoagulable may remain three weeks, even a month or more without a trace of putrefaction, while the normal blood undergoes putrefaction in three or four days at the longest.

To elucidate the cause of this imputrescibility, we have studied the resistance to putrefaction of the blood rendered uncoagulable *in vitro*, that is to say, mixed with the extract of leeches, prepared by boiling and sterilized (we have found that this extract can be sterilized at 110 to 120 per cent. without driving off its anti-coagulating properties). This blood requires a much longer time to undergo putrefaction than the normal blood, but it will not resist longer than from four to six days.

This resistance to putrefaction is not due to a direct antiseptic action of the extract of the leech, since it constitutes a favorable medium for the culture of many species of microbes.

This quality of imputrescibility of the uncoagulable blood, must then be attributed to modifications produced in the blood itself, under the influence of the extract. Indeed, in this blood, the white globules have preserved their vitality and very energetic amoeboid movements may be observed even at the ordinary temperature. This blood remained "vivant" for a long time after removal from the organism. There is room then for the supposition that this persistence, and even an exaggeration of vitality, in the leucocytes, leads to the persistence and the increase of their phagocytic power. But, as the imputrescibility persists even when the leucocytes are dead, it is probable that the putrefaction is not prevented, solely, by the phagocytic action of the white globules, but also by the increase of the bactericitic power of the blood due to the leucocytic secretions.

If this is really the case, it may reasonably be asked if the anti-coagulating substances are not capable of increasing the means of protecting the organism, and of conferring an immunity against infection just as the toxines. This hypothesis has seemed to us the more probable from the fact that there are many points of resemblance between the anti-coagulating substances, such as the peptone, the extract of leeches and the microbic toxines.

Our experiments have enabled us to verify this hypothesis experimentally. They have proved particularly that the injection into the veins of peptone, or the extract of leeches, is sufficient to keep the blood from coagulating for several hours, and if injected fifteen minutes to three-quarters of an hour before the injection of a poisonous dose of colibacillus, or the streptococus, into the veins, it imparts to the animal, as dogs and rabbits, a perfect immunity from their action. The preventive power may be considered as nearly absolute, and in this case we find very distinct reaction taking place in the respiration, in the warmth of the system and in diuretic action.

ANTIKAMNIA AS A SEDATIVE.—Dr. Albert M. Williams, of Bradford, Pa., reports that he has used antikamnia extensively in his practice, as an efficient sedative. For several years he has given it in ten to fifteen-grain doses to adults, and, when needed, repeating the dose every hour or two hours. He has rarely been disappointed in controlling pain, if the pain was of a character to be controlled by medicine. And he has never found it to be followed by any of the unpleasant effects common to opiates.

A NEW REMEDY FOR CANCER.—The Rev. R. J. Nevin, D.D., in a letter to *The Churchman*, October 3d, writes that, while he was in Piacinza, an Italian city of 40,000 inhabitants, recently, the daughter of the principal notary was found, on a consultation of the leading physicians to be suffering from an accumulation in her stomach of bronze medals of a locally celebrated Madonna. She had for two weeks been taking one a day, by direction of her confessor, to cure a suspected internal cancer, and a physician assured me that other like remedies, taken by advice of confessors, often interfered with his practice.

ADMONITION.—She lived a life of virtue, and died of cholera morbus, caused by eating green fruit, in hope of a blessed immortality, at the early age of 21 years, 7 months and 16 days. Reader, "Go thou and do likewise."

EDITOR'S TABLE.

SANITARIAN, NOVEMBER NUMBER, 1896.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

THE NATIONAL SANITARY ASSOCIATION held its second annual meeting in the rooms of the Kings County Medical Society, Brooklyn, October 14-15, 1896. There was an audience of about thirty persons at the opening session, swelled to nearly twice that size before the close.

Dr. F. A. Jewett, of Brooklyn, presided, and Mr. Thomas E. Veale, of Atlanta, Ga., acted as secretary. The first paper read was by Dr. T. C. Craig, U. S. Navy, on "Municipal Control of Consumptives." While he considered the time premature, perhaps, for the municipality to take charge of persons suffering with tuberculosis, considering the contagiousness of the disease, he thought the public must be educated up to the necessity, and the sooner the better. The paper presents many points of practical utility and elicited considerable discussion. [We expect to publish it in full hereafter.]

"The Work of the Division of Contagious Diseases of the New York Health Department," was the subject of a paper by Dr. Charles S. Benedict, Chief of the Bureau of Contagious Diseases. It was followed by a discussion in which Dr. Joseph H. Raymond, Dr. Charles S. Benedict, Dr. E. A. Wilson, Dr. A. N. Bell, Dr. E. H. Bartley, Dr. F. S. Kennedy, Dr. J. M. Raub, Dr. H. T. Hotchkiss and others joined.

Dr. E. A. Wilson, Health Officer of Meriden, Conn., spoke on the advisability of leaving the question of disinfection to the attending physicians, although he did not favor too much reliance on them in that respect.

Dr. A. N. Bell spoke on isolation hospitals, and evidently was not in favor of them save in some instances. Excepting small-pox, he believed there was no evidence of the aerial distribution of any contagious diseases at any considerable distance. Excepting small-pox, no evidence that any such disease ever crossed the street. He dwelt on the objection of people generally to having any member of their families sent to isolated hospitals, and thought that the practice of the health authorities in this regard, excepting cases of small-pox, was, with rare exceptions, unnecessary and calculated

to encourage the needless alarm of people at the proximity of hospitals and sanitariums generally, even for the care of non-contagious diseases, with no danger whatever to the neighborhood. He added with great earnestness that, with the exception he had made, he thought every provision could be made for such diseases at home.

Dr. Bartley agreed with Dr. Bell. He condemned the quarantining of children from school who happened to live in an apartment house where there was one child infected. It was unjust to the children and unjust to the cause of education. Where the child infected was kept in one room, he guaranteed there would be no danger to any of the other members of the family. The contagiousness of diphtheria by germs floating in the air was practically *nil.* Where reasonable precautions were taken there was no danger whatever, and no quarantine should be enforced.

Dr. Bartley read a paper on the "Duty of the Board of Health to the Public," in which he recommended the dissemination of sanitary information, and instruction on hygiene and sanitary science in the high school as regular branches of the course, by teachers specially trained.

Other papers read were: "Notes on the Bacterial Diagnosis of Pulmonary Tuberculosis and Mixed Infection," by Charles B. Fitzpatrick, M. D., of New York city; "Notes on the Small-Pox Epidemic of 1893-94 in Brooklyn," by H. H. Morton, M. D.; and "Enforcement of Legal Process of Municipal Sanitary Ordinances," by Albert R. Moore, of Brooklyn, on which there was no time for discussion.

The convention adjourned till 10 a. m. the following day.

At 1 o'clock the delegates lunched at the Crescent Athletic Club on the invitation of Drs. Emery and Jewett, and later they accepted the invitation of Dr. A. H. Doty, Health Officer of the port of New York, to visit Quarantine.

Much interest was taken in the site and equipment of the quarantine establishment, not excepting a three-story combustible structure that had been erected under the spur of threatened cholera three years ago, which by the consensus of opinion of the visitors should now be burned down or otherwise destroyed, before the risk of any human life is taken by its occupancy. Otherwise the establishment is admirably equipped.

The second day was taken up by a visit to Barren Island, on the invitation of the Messrs. Cranford, to inspect the garbage reduction plant of the New York Sanitary Utilization Company. The

Messrs. Cranford also entertained the party at luncheon on board the boat.

The business programme was finished on the way to the island.

Officers were elected as follows: President, Dr. F. O. Young, Lexington, Ky.; First Vice-President, Dr. F. A. Jewett, Brooklyn; Second Vice-President, Dr. C. S. Benedict, New York City; Third Vice-President, Dr. E. A. Wilson, Meriden, Conn.; Secretary, Thomas E. Veal, Atlanta, Ga;. Treasurer, Carlton E. Hoadley, New Haven, Conn.; Executive Committee—A. R. Moore, Brooklyn, chairman; C. E. Hoardley, New Haven, Conn.; Dr. Z. T. Emery, Brooklyn; Dr. Wallace Sibley, Rochester, N. Y.; Dr. E. St. George, Fall River, Mass. The next place of meeting, Lexington, Ky.

Resolutions were adopted thanking all who had contributed to the success of the convention, and especially Brooklyn, for its splendid hospitality to the delegates. Dr. F. A. Jewett was congratulated for the aid and advice he had given during the convention.

The Garbage Plant was the prominent subject of interest to all the visitors. The process of disposal is here undertaken on a scale not hitherto attempted in this country, if indeed elsewhere. It embodies conditions, machinery, and expense of such magnitude as to inspire full confidence in the successful execution of the work—by the contractors at least—or, it certainly never would have been undertaken at such an outlay. And a careful inspection throughout, to our mind, fully justifies their expectation. We purpose a full description in an early number.

WHERE BATHS ARE SCARCE.—The New York *Sun* remarks that there are many curious facts connected with the social life of the population of one of the great tenement districts on the west side of the city which have been brought to light by the sociological canvass of the Fifteenth Assembly district, just completed by the Federation of Churches and Christian Workers. The Fifteenth Assembly district lies mostly in the old Twenty-second ward, and is bounded by the Hudson river, West Forty-sixth street, Tenth avenue, West Forty-third street, Eighth avenue, West Fifty-third street, Ninth avenue, West Fiftieth street, Tenth avenue, West Forty-ninth street, and the Hudson river. Upon the subject of proper facilities for cleanliness in this district the report says:

"The canvass of the federation shows that there are only 1,037 bathtubs for 8,176 families, or one bathtub to 7.9 families. Of these

baths 767 are in houses between Eighth and Ninth avenues, in which 3,334 families live, or one to 4.3 families. Thus, for the 4,482 families west of Ninth avenue, the federation discovers only 270 bathtubs, or one to 17.9 families. For the 3,105 families between Ninth and Tenth avenues, 262, or one to 11.9 families. For the 1,737 families west of Tenth avenue it discovers but 8, or one to 217.1 families. For the 1,321 from Tenth to Eleventh avenues it discovers three tubs, or one to 440.3 families. For the 416 families west of Eleventh avenue it discovers five tubs, or one to 83.2 families. The tiers of blocks between Eighth and Tenth avenues and Eleventh avenue and the river seems, strangely enough, to be the best provided.

"It is safe to say that the above statistics show that there is no region in the city in which public baths and lavatories are more urgently demanded. If one of the blocks above mentioned is secured for a park, public baths could be attached thereto, summer and winter."

But it is a still more curious fact that, notwithstanding the *mandatory* Free Public Bath Act of April 19, 1895, requiring that "all cities of the first and second classes *shall* establish and maintain such number of free public baths as the local board of health may determine to be necessary," Brooklyn's Board of Aldermen persists in rating Brooklyn as one of the privileged "cities, villages or towns having less than 50,000 inhabitants that *may* appropriate its funds for the purpose of establishing such free public baths." The said Aldermen, apparently being so inured to the conditions common to uncleanness where appropriations are necessary, that the mandate of the Legislature and the health of the people are alike of no consequence to them beyond the interest they take in the expenditure of public funds. And so, too, in regard to

THE FACTORY AND MERCANTILE ESTABLISHMENT LAW.

This law provides that before children can work in such establishments they must obtain a certificate from the local board of health stating that they have been examined by the board and found eligible to work in such establishments, as regards their age, health, education, etc. It also requires sanitary regulation of the establishments and limits the hours of employment. To effect these purposes competent employes with reasonable compensation are necessary. Like the law for the establishment of public free baths, the law is mandatory. And, excepting in Brooklyn, it promptly went into effect

throughout the State in accordance with the mandate September 1st. The Commissioner of Health promptly recognized the requirements of the law by making requisition on the common council or funds to carry it into effect; but his reqisition was ignored. And now that the State Factory Inspector calls on him for returns, in accordance with the law, he finds himself constrained to publish the following statement:

"An intimation was sent to me that unless I consented to the appointment of certain persons as inspectors the common council would give me no money for the purpose of carrying out the law. I did not propose to have incompetent persons so employed, and I refused to consent to the arrangement. The consequence was that I got no money to carry out the law's provisions. That is all there is to it. I don't know if things will be any better next January, but I hope so. A number of young people have been excluded from employment in factories because they have been notified that they cannot work unless under a certificate from the health department. We cannot give certificates, for we have not the means to make the necessary investigations in the cases. The law excludes all children from factory or mercantile employment between the ages of 14 and 16 years without a certificate from this department to the effect that they have been at least a year at school and are in a good bodily condition.

"We cannot give a certificate without an investigation, and we can make no investigation without the necessary help to do it."

THE PURIFICATION OF THE BROOKLYN WATER SUPPLY has been placed under the supervision of Professor Albert N. Leeds. Professor Leeds is employed to make and personally oversee all the chemical, microscopic and bacteriological observations as well as color tests and any and all other investigations that may be required of each and all the sources of the Brooklyn water supply so as to definitely locate and specifically determine the cause of the recent condition in rgard to odor, color and taste of the city water, and record, tabulate and submit the results and report on the same and advise on the proper method of cure and prevention. The investigation and report of Professor Leeds is to be submitted complete in accordance with the foregoing on or before the 15th of February next. Professor Leeds shall also submit a complete plan for the equipment of a permanent laboratory to conduct the chemical, microscopic and bacteriological examinations and color tests

in accordance with the best and latest practice, specifying the instruments required and cost of the same.

Meanwhile the stench of the decomposing filth that is in process of being removed from the reservoirs is so great that the health authorities of Hempstead claim that to clean the ponds and place the substance taken from them on the banks would prove detrimental to the health of the residents of that town. The Hempstead authorities say that the courts will be resorted to if Brooklyn insists upon cleaning the ponds, and there is some talk that the Sheriff may be called upon to prevent the work if it should be attempted.

Nobody doubts the competency of Professor Leeds to do all that he has undertaken to do with regard to the impurities in question, or that he will find therein a fruitful field for biological study. But there is just as little doubt in the minds of the intelligent people of Brooklyn with regard to the sources of the disagreeable qualities of the water recently manifested before Professor Leeds' investigations as there will be afterwards. There is no likelihood of an effort on his part to reverse the causal relations of the filth in the ponds and the germs that have been or others that yet may be found in consequence of it.

About Death Rates.—*Knowledge* for July has a paper by Alex. B. MacDowall, A. M., with diagram showing that the generally recognized improvement in the death rate is not an all-round one; that is to say, it holds good only, as we may put it, for the earlier half of life. The death rate of middle-aged and elderly people has increased. The age-periods are differentiated by curves of three groups, showing an average decline of the death rate until the age group 45 to 55 is reached, when a gradual rise in the death rate occurs. The two next decade-groups that follow are of the same type. The rise in the death rate of adults—amounting in the three groups to about six, twelve and seven per cent. respectively, from first to last—presents an important problem in sociology. Curves are also presented differentiating the death rates in relation with the different conditions of life in London, East and West, since 1851. Curves differentiating London, England and Ireland show that the death rate in Ireland is generally less than that for England and Wales. The lower death rate in Ireland is attributed to the more largely rural condition of the population.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

ALABAMA.—DR. W. H. SANDERS, Montgomery, State Health Officer, recently elected, to fill the vacancy created by the death of Dr. Jerome Cochran, declares one of his first aims will be to arouse the interest of probate judges and county commissioners throughout the State in practical sanitation, and to appeal to those who have not already voted an appropriation for carrying it on to do so, in accord with enlightened public policy. Until this can be done county health officers are advised and urged to courageously push on with the work, remembering the favorite words of our deceased health officer and deriving comfort therefrom, namely, that "the best work done in this world is never paid for and can never be paid for."

Mobile, 31,076: J. A. Abrahams, M. D., Health Officer, reports for August: Deaths, 96—22 under five years of age. From malarial fever, 8. Annual death rate, 22.80.

CALIFORNIA.—J. H. Davidson, M. D., President, Los Angeles; J. R. Laine, M. D., Secretary, Sacramento. The Secretary reports for September: Returns from 46 cities, towns, villages and sanitary districts, aggregating a population of 728,714, show a mortality of 865—a death-rate of 1.18 per thousand for the month, or 14.16 per thousand per annum. There were 156 deaths from consumption, 43 from pneumonia, 22 from bronchitis, 3 from congestion of the lungs, 9 from diarrhoea, 24 from cholera infantum, 65 from other diseases of the stomach and bowels, 4 from diphtheria and croup, 3 from whooping cough, 7 from malarial fever, 21 from typhoid fever, 12 from cerebro-spinal fever, 33 from cancer, 1 from erysipelas, 89 from heart diseases, 3 from alcoholism, and 370 from all other causes.

Fourteenth Biennial Report for the fiscal years ending June 30, 1895 and 1896; together with report of the transactions of the fourth annual sanitary convention, held April 20, 1896: a volume of 278 pages. It comprehends in detail the reports of which monthly abstracts have been given in these pages. Vital statistics as summed up for the two years respectively—year ending June 30, 1895: Total deaths reported 10,976—under five years of age 2,198; from chief causes—from phthisis pulmanalis, 1,790; bronchitis, 316; tubercular meningitis, 265; heart diseases, 864; pneumonia, 728; fevers (typhoid, 250), 390; diarrhoeal diseases, 272; diphtheria (and croup), 172; enteritis, 237; Bright's disease and nephritis, 414; cancer, 413; marasmus, 215.

For the year ending June 30, 1896: Total deaths, 10,462. Under five years of age, 1,921; from chief causes—phthisis pulmanalis, 1,534; bronchitis, 237; tuberlar meningitis, 305; pneumonia, 687; heart diseases, 956; fevers (typhoid, 194), 297; diarrhoeal diseases, 191; diphtheria (and croup), 116; enteritis, 196; Bright's disease and nephritis, 383; cancer, 451; marasmus 305. Population not given; death rates not estimated.

San Francisco, 330,000. Reports for September: Deaths, 466—123 under five years of age. From consumption, 90; acute pulmonary diseases, 39; from zymotic diseases, 35. Annueal death rate, 16.92.

The Board of Health has notified (September 16th) all householders of the city that they must not permit their property to remain in an unsanitary condition; that within thirty days a house-to-house inspection would be made, and that all buildings unfit for habitation would be torn down.

Oakland is in trouble with garbage disposal. Dr. Bradley, the health officer, on a recent visit to the dumps, found them in such an unsanitary condition that he believes the $3,800 paid yearly for the removal of garbage could be saved without jeopardizing health further than it is at present. The garbage under the system now used is first screened and that portion which is too large to go through the meshes is carried out of the city in box cars. According to the idea of the health officer the most dangerous refuse passes through the net. He urges cremation.

Los Angeles, 100,000. Reports for September: Deaths, 98—21 under five years of age. From consumption, 21; acute pulmonary diseases, 7; from zymotic diseases, 11. Annual death rate, 11.76.

COLORADO.—*Denver*, 150,000. William P. Munn, M. D., Health Commissioner, reports for September: Deaths 23, of which there were from diarrhoeal diseases, 32; typhoid fever, 179 cases reported, 28 deaths; diphtheria, 21 cases with 2 deaths; scarlet fever, 8 cases, 1 death; from consumption, "contracted elsewhere," 15. Annual death rate 9.84.

Under date of October 12th, the Health Commissioner asked the special attention of the Mayor to the pollution of the water supply, with special reference to the prevalence of typhoid fever during the last four months, as follows: Cases reported for June, 8; July 44, with six deaths; August 170, with 13 deaths; September 179, with 28 deaths. The sources of the water pollution are pointed out in detail, and the responsibility appears to be fixed on the water company.

CONNECTICUT.—Professor William H. Brewer, Ph. D., New Haven, President; Professor C. A. Lindsley, M. D., Secretary New Haven.—The Secretary's bulletin for September comprises reports from 164 towns in the State, with an aggregate population of 850,290, from which the number of deaths reported for the month was 1,188. The death rate for the larger towns is 16.8; for the smaller 16.6, and for the whole State, 16.7. Deaths from zymotic diseases, 307—25.8 per cent. of the total mortality—chiefly from diarrhoeal diseases 176, diphtheria 39, and typhoid fever 34.

Though *typhoid fever* continues prevalent in New Haven—47 cases with 4 deaths for September—diphtheria is also more prevalent there than elsewhere; 37 cases with 8 deaths for the month.

DISTRICT OF COLUMBIA, white, 187,600; colored, 87,900: 275,500. W. C. Woodward, M. D., Health Officer.

Report for the week ending September 20: Deaths 100. The death rates were: For whites, 13.5; for colored, 29.2, and for total population, 18.5. In the corresponding period of last year the total rate was 20.0. Two deaths from diphtheria and two from whooping cough embrace the range of the contagious affections in fatal form. Typho-malarial attacks caused three deaths and typhoid fever six.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M. D., State Health Officer, Jacksonville.

Pensacola, 15,000: A. Grant, Secretary, reports for September 21 deaths, of which 9 were of colored persons and 6 under five years of age. Annual death-rate 16.8 Consumption caused 1 death and typhoid fever 1.

GEORGIA. *Atlanta* (Constitution) September 24: Health Inspector Veal is waging an unceasing war against the use of well water by residents of Atlanta. The rapid growth of the city and the close proximity of the dwellings makes the drinking of city well water dangerous. The hydrant water is pure and healthful, and the health inspector insists that if it were used exclusively there would be much less sickness in the city than under existing circumstances when some families still use well water for drinking and cooking purposes.

Speaking about the matter yesterday Inspector Veal said:

"The official records positively prove that nearly all cases of fever in Atlanta this summer have been caused from well water drinking. In a few cases there has been fever in homes where hy-

drant water is used, but in nearly every one of these the fever was contracted at other places by drinking well water.

"In the three months of July, August and September, up to date, there have been thirty-two cases of typhoid fever. Of this number twenty-three were reported from homes which use well water, and nine from homes which use hydrant water. Of the nine latter cases six were contracted elsewhere by the use of well water. The hydrant water is pure and wholesome, and if adopted by all Atlantians would result in a decided decrease in the death rate."

Macon (Telegraph) September 27: The Board of Health deems it expedient and opportune to promulgate the following:

For the purpose of the preservation of the public health and the prevention of the introduction and generation of infectious or contagious diseases in the city of Macon, the Board of Health most earnestly urges on all citizens, parents, guardians, or other persons having control of children, the necessity of immediate vaccination. In making the appeal the Board desires it understood that there need not be any apprehension of any immediate danger of the introduction or prevalence of that loathsome disease, smallpox; but a peculiarity of the disease is that it may steal into our city like a thief in the night, and to provide against it is the duty of the Board.

ILLINOIS.—William E. Quine, M. D., President, Chicago; J. W. Scott, Secretary, Springfield.

Chicago, 1,619,226: William R. Kerr, Commissioner, reports for September: Deaths, 1,658—691 under five years of age. Death rate for the month, 1.02; for the year ending September 30, 14.72. Prevailing causes of death and the numbers: From diphtheria, 93; typhoid fever, 87; consumption, 174; pneumonia, 78; bronchitis, 52; whooping cough, 28; diarrhoeal diseases, 138.

The increasing prevalence of typhoid fever is the subject of much agitation among the people generally, particularly with reference to the public schools and means of purifying the drinking water. The proposition by the health department to introduce filters in the public schools has been acted upon by the Board of Education, with much embarassment however, on account of the contention over the *kind* of filter contended for by many makers, and each one urging the "best." The source of the water supply is confessedly dangerous, so dangerous that the Health Commissioner and his efficient deputy, Dr. Reilly, urge all consumers to boil the water before drinking it, but, notwithstanding these precautions, the fever prevails, and is likely to prevail so long as the

water used for domestic purposes is contaminated at its fountain head; for it should be borne in mind that drinking it is far from being the only means of ingestion. The food and food utensils are ever liable to contamination by its use, in so much that there can be no guaranty of safety so long as the present conditions of the supply obtain. Deaths reported from impure water diseases during the two weeks ending October 10,110.

An inspection by the City officials, October 15 (Tribune), found that at a point four and one-half miles from shore the water looked to be pure. Three miles out signs of sewage pollution were plainly visible. The members of the committee were unanimous in the opinion that to get pure water the crib must necessarily be located at least four miles from shore. But even at this distance from the outfall of the sewers, persons of much practical knowledge of the influences of prevailing winds over bodies of water well know the fallacy of such estimates.

INDIANA.—Douglass C. Ramsey, M. D., President, Mount Vernon; J. N. Hurty, M. D., Secretary, Indianapolis.

Diphtheria is reported to be prevalent at many places in the State. Indianapolis (News), October 10: The Secretary of the State Board of Health has returned from Redkey, where diphtheria has been raging for four weeks. He was called there once before, and found that the Town Board had not appointed a health officer, as the statute provided, and since then the officer has not had the support necessary to stamp out the disease. Out of forty cases fifteen have died. A town meeting was held yesterday, and steps were taken to organize a sanitary society. Secretary Hurty said that there were several cases where funerals following death from diphtheria were held publicly without interference by the Town Board. The excuse in one case was that the preacher objected to a private funeral.

Since September 14th to the date of this writing, October 15th: *diphtheria* has been reported prevalent, in most cases to such an extent as to require the closure of the schools in *Frankton, Harrison township, Marleville, Elkhart, Dunkirk, Valparaiso,* several places in *Delaware County, Gas City, West Hammond, Bloomingdale* and *Fort Wayne.* Dr. Hurty, the Secretary of the State Board, has recently promulgated certain rules for the protection of the health of school children. Their necessity is well shown by Mr. W. H. Chillson, school superintendent in Clay county, complaining of the condition of the schools in Clay City. He says: "School com-

menced here last Monday without having the rooms scrubbed or in any manner disinfected. No attention has been given to cleaning or disinfecting the vaults. The school board even refuses to employ a janitor, and the teachers refuse to do janitors' work, leaving the rooms uncleaned. * * * * * Nearly every year we have epidemics of scarlet fever, diphtheria, whooping cough, measles, mumps and other things that interfere with the schools."

This statement is believed to be safely applicable to the schools of many other localities in the State.

Typhoid fever is reported prevalent in *Crown Point.* The milk supply is suspected.

Richmond: T. H. Davis, M. D., Health Officer, reports for the year ending April 30th, 1896: Total deaths, 255; of which 53 were under five years of age. Death-rate 12.0. There were 23 deaths from consumption, 15 from typhoid fever, 20 from pneumonia, 9 form diphtheria, 17 from meningitis and 13 from apoplexy.

"Special attention is given the matter of contagion in Richmond. With the able assistance of the Superintendent of Public Instruction, the school-room is considered quite secure from danger of infection. Aside from the disinfection of schools when required, upon the suspicion of indisposition of a pupil, it is at once sent home, only to return (in case of a contagious disease) upon the certificate of the attending physician, properly endorsed by the Health Officer. The indiscriminate use of pencils at school has been abandoned. The practice of collecting and distributing pencils, as heretofore practiced, has been fraught with danger, as children are prone to put pencils in the mouth, thus conveying disease from one to another. When library books are found at houses where contagious disease is present, the books can not be returned until disinfected by the Health Officer, and a certificate returned with the books establishing the fact, and in some cases of especial risk the books are destroyed. The Milk and bread tickets are a source of danger when handled by persons where contagion exists, and subsequently returned to the owner to be redistributed among the well. To avoid this danger, the inspector is instructed to take up and destroy all such tickets, and give a certificate setting forth the fact of their destruction, when those furnishing milk or bread continue to furnish the amount represented by the tickets destroyed."

Iowa.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

Biennial Report of the Board for the fiscal period ending June 30, 1895: A volume of 380 pages comprehending the minutes of the meetings held; detailed work for the suppression of smallpox; special investigations of, and sanitary effort for the suppression and prevetion of diphtheria and tuberculosis, aetinomycosis and anthrax. Special reports and essays on quarantine, dissinfection, resuscitation of the drowned, resuscitation from lightning shock, water and water supplies, food value of fruit, house drainage, cisterns, school accomodations, and several other subjects of importance in sanitary administration. Legislation is urged for an efficient registrative law for the prevention of food adulteration, and appropriations to make such legislation effective.

Davenport, 31,484.—A. W. Cantwell, M. D., Physician, reports for September: Number of deaths, 27—9 under five years of age. Death rate per thousand, 10.9. Zymotic diseases caused 7 deaths, and consumption 4.

Diphtheria is reported prevalent throughout the State; more particularly in *Maquoketa, Salem, Manson, Dows, and Dubuque.*

KANSAS.—T. E. Raines, M. D., President, Concordia; T. Kirkpatrick, M. D., Secretary, Westphalia.

Phillipsburg, September 18th: The schools have been closed on account of an epidemic of diphtheria and children under 16 were prohibited from going on the streets.

KENTUCKY.—Joseph M. Matthews, M. D., President, Louisville: J. N. McCormick, M. D., Secretary, Bowling Green.

Covington, September 21st: *Diphtheria* is reported increasingly prevalent, over twenty-five cases at this date and causing considerable alarm.

Louisville, October 4th: *Diphtheria* is reported to be more prevalent than it has been for several years. The disease is also epidemic in portions of Marshall, Graves, and Harrison Counties. *Typhoid fever* is prevalent in Letcher county, attributed to the usual cause —polluted water.

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. F. Patton, M. D., Secretary, New Orleans.

New Orleans, 275,000—80,000 colored: Deaths in September, 452—colored, 158—138 under five years of age—42 colored. Deaths from consumption, 54; pneumonia, 14; bronchitis, 19; *small-pox*, 1; cholera infantum, 7; enteritis, 11. Death rates: Whites 18.09: colored, 23.70: 19.72.

MAINE.—C. D. Smith, M. D., President, Portland; A. G. Young, M. D., Secretary, Augusta.

North Vassalboro, October 13th: *Diphtheria* is prevailing. The village schools were closed on account of it two weeks ago and the school rooms cleaned, after which they were opened. Since the recurrence of new cases they have been closed again.

MARYLAND.—John Morris, M. D., President, Baltimore; John S. Fulton, M. D., Secretary, Baltimore.

At the monthly meeting of the Board, October 8th., Prof. W. B. D. Penniman, chemist to the board, reported in regard to the prevalence of *typhoid fever* at *Chestertown*. "The public water supply," he said, "comes from two springs, one at the head and the other at the end of a long valley with marshy bottom. On one side of the valley are quite a number of houses, many of which are in very bad condition from a sanitary standpoint. There are a large number of open closets, pigpens, open drains, and at least one slaughter house, in bad condition. All of this offal drains into the valley, the lower part of which is merely an open sewer full of filthy matter. As might be expected, this supply shows marked signs of contamination, which can only be remedied by proper precautions. A number of pump wells were also examined, and found in an undesirable condition. It was stated that there were from thirty-five to fifty cases of typhoid fever in the town at one time."

An investigation was also reported in regard to *typhoid fever* at *Elkridge Landing*, where nine cases were found. Nuisances were investigated, and five samples of water used by those suffering from the disease were analyzed. The analysis showed that the water was polluted, and a notice stating that the water was not fit for domestic purposes, and warning persons against its use, was placed upon each of the five pumps.

City Health Commissioner McShane stated that analysis of milk from Baltimore county showed the presence of pus, and the board decided to ask the owner to separate the unhealthy cows from the remainder of the herd.

Baltimore, 506,398—75,344 colored. James F. McShane, M. D., Health Commissioner, reports for September: Deaths, 767; 592 white persons, and 175 colored. Death rates; Whites, 16.48; colored, 28.00: 18.18: 301 were children under five years of age. Deaths from consumption, 91; pneumonia, 22; cholera infantum, 32, typhoid fever, 29; infectious cases, 56.

[illegible]—[illegible] S. W. Abbott, M. D., Secretary, Boston.

[illegible] S. H. Durgin, M. D., Chairman, Dedham; [illegible] 1,262—60 more than five years of age. Annual death rate, 20.97 per 1,000. From diphtheria 3, scarlatina 8, consumption, 12, and others 22. Cases of contagious diseases reported for the month: Diphtheria 20, measles 291, scarlatina 72, typhoid fever, 50.

The Cambridge Epidemic. The Boston *Post* of October 14th publishes the following rather startling revelation about the recent prevalence of typhoid fever in Cambridge:

There have been many deaths from typhoid fever in Cambridge during the past two months, and the cause of the disease has not been satisfactorily explained.

First it was charged to impurities in milk, and several dealers, along whose routes cases of the dread disease have been reported have practically lost their business.

The *Post* is in possession of information which may in part account for the temporary epidemic which has caused so much alarm to the residents of the University City.

Every inhabitant of Cambridge, which may incidentally be said to be a no-license town, who drinks water, and all good citizens are expected to obey the "no" edict, drinks a supply from Stony Brook reservoir, the head waters of which pour through Waltham. In the improvement of this water basin the Cambridge Water Board has had employed by contract a large number of Italian laborers.

All these facts have considerable bearing on the kind of water that has been run into Cambridge homes, and here are some things that have happened to the water as it pours on its way to the drinkers:

It has been used for bathing purposes by the Italians.

It has been used to wash clothing and other wearing apparel by the Italians and others.

It has been polluted by deposits from typhoid fever patients, who either lived at the basin among the laborers, or else at houses adjoining and draining into the river.

Salem (Gazette) October 5th: *Diphtheria* is increasingly prevalent, there now being forty-five cases on unofficial record of the Board of Health.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

The Secretary reports: For the month of September, 1896, compared with the preceding month, influenza, pleuritis, inflammation of kidney, typhoid fever, tonsillitis, and bronchitis increased and cholera morbus, and cholera infantum decreased in area of prevalence.

For the month of September, 1896, compared with the average for September in the 10 years, 1886-1895, pleuritis and typhoid fever were more than usually prevalent and intermittent fever, cholera infantum, cholera morbus, remittent fever, dysentery and consumption were less than usually prevalent.

Including reports by regular observers and others, *consumption* was reported present in Michigan in the month of September, 1896, at 228 places: *typhoid fever* at 166 places; *diphtheria* at 54 places, *scarlet fever* at 46 places; *whooping-cough* at 30 places and *measles* at 12 places.

Reports from all sources show *consumption* reported at 11 places more; *typhoid fever* at 66 places more; *diphtheria* at 20 places more; *scarlet fever* at 12 places more; *whooping-cough* at 3 places more and *measles* at 13 places less in the month of September, 1896, than in the preceding month.

Detroit (News), October 10th: There are 19 cases of diphtheria and 25 of scarlet fever in the city. During the week 22 new cases of diphtheria were reported, showing that it is on the increase. It is also assuming a more virulent type and caused death in seven cases.

MINNESOTA.—Franklin Staples, M. D., President, Winona; C. N. Hewitt, M. D., Secretary, Red Wing.

St. Paul, 215,000: Alexander J. Stone, M. D., Commissioner, reports for September: Deaths, 115—43 under five years of age. Annual death rate per 1,000 was 6.42. Deaths from diphtheria, 6; consumption, 17; cholera infantum, 4.

Minneapolis, 225,602: H. N. Avery, M. D., Commissioner, reports for September: Deaths, 131—50 under five years of age. Deaths from diphtheria, 18; cholera infantum, 3; consumption, 9; typhoid fever, 7. Death rate for the year ending September 30th, 8.04.

Austin (St. Paul Dispatch), October 8th: The Board of Health and the Board of Education held meetings last night and decided to close the city schools for a time on account of prevalence of *diphtheria*.

MISSISSIPPI.—At a meeting of the State Board of Health, October 7th, Dr. H. H. Harrolson, quarantine inspector of the port of Biloxi, read an exhaustive report.

The report recited the fact that the quarantine methods of the United States government were loose in the extreme, and that

there was great danger from infected vessels. The report set forth the fact that the inspector had inagurated many reforms, but the trouble is that the state has very little authority, all of it being vested in the United States Marine Hospital Service.

MISSOURI.—F. J. Lutz, M. D., President, St. Louis; Willis P. King, M. D., Secretary, St. Louis.

St. Louis, 570,000—31,000 colored: M. C. Starkloff, M. D., Commissioner of Health, reports for September: Deaths, 682—207 under five years of age. From diphtheria, 38; phthisis, 89; typhoid fever, 13; diarrhoeal diseases, 37. Annual death rate per 1,000 white, 13.58; colored, 27.3

Diphtheria is prevalent in Kansas City, Marshall and Independence.

Jefferson Barracks (St. Louis Post-Dispatch), September 19th: As the result of an epidemic of *typhoid fever* at Jefferson Barracks, over 100 sick and convalescent soldiers will be left behind when the troops start Oct. 3 on their practice march. Many are so ill that recovery is almost impossible. The wards are so crowded that tents have been pitched on the grounds for the accommodation of the overflow.

MONTANA.—*Centerville* (Butte Miner), September 29th; Dr. F. W. McCrimmon, who is health officer for all the city and all the county, except Walkerville, has ordered all the schools closed on account of the prevalence of *diphtheria*.

Helena (Independent), September 17th: A county board of health has been organized on account of the prevalence of *typhoid fever* in the vicinity.

There are not many cases of contagious disease in Lewis and Clarke county at the present time. In Marysville several cases of *typhoid fever*. Aside from Marysville there are said to be only two or three cases of that disease or of diphtheria in the county.

Butte City (Inter Mountain), September 17th: Dr. McCrimmon, the City Physician, reported that the diphtheria epidemic was well under control, no new cases having been reported for the past 10 days.

NEBRASKA.—J. V. Beghtol, M. D., President, Friend; F. D. Haldeman, M. D., Secretary, Ord.

Nebraska City (Omaha Bee), Sept, 15th.—(Special.)—An epidemic of diphtheria has broken out among the children of the city.

It has spread to such an extent as to cause the Board of Education to postpone opening the fall term of school.

Battle Creek, September 20th:—About two weeks ago there were twelve persons down with *typhoid fever.*

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

Hudson County.—Jersey City and vicinity, 338,671.—W. W. Varick, M. D., President. During September there were 410 deaths of which 200 were under five years of age. Annual death-rate, 17.4 per 1,000. Diphtheria caused 21 deaths; scarlatina, 2; whooping-cough, 13; typhoid fever, 7; pneumonia, 34; bronchitis, 11; consumption, 39; diarrhoeal diseases, 19.

Newark, 215,725: Health Officer Chandler reports for the three weeks ending October 3: Deaths, 235—100 under five years of age; from diphtheria, 6; consumption, 5; pneumonia, 2. Annual death-rate, 18.85.

October 8th (Newark Advertiser). TheBoard of Health is confronted with a serious problem, that of stamping out the incipient *typhoid epidemic.* Health Officer Chandler is devoting nearly all his time to the matter, and has come to the conclusion that the trouble is due solely to the contamination of well water.

Paterson, 103,020: J. L. Leal, M. D., Health Officer, reports for September: Deaths, 137—67 under five years of age; from diphtheria, 15: consumption, 9; pneumonia, 4; diarrhoeal diseases, 9. Annual death rate, 13.24 per 1,000.

Typhoid fever is prevailing extensively in *Camden* and in the State reform school near Jamesburg. *Diphtheria* also is prevalent in Camden.

NEW YORK.—Daniel Lewis, M. D., President, New York: B. T. Smelzer, M. D., Secretary, Albany.

The Secretary's *Bulletin* for August reports: 12,475 deaths, 1,600 more than in the corresponding month of last year, attributable mainly to deaths from the *direct effects of heat* (sun stroke), occurring mostly during the early part of the month, 1,125 deaths from this cause having been reported; 1,040 were reported from New York city and Brooklyn, the recorded deaths occurring mostly in the maritime and Hudson valley districts. These are reported under deaths from *Accidents and Violence.* There is also, compared with August, 1895, an increase in the reported mortality from diseases of the *urinary, nervous* and *circulatory* systems, and also in deaths from

old age and from unclassified causes. There was no material variation in the mortality from zymotic diseases and consumption, the number of deaths from diarrhoeal diseases being about the same as last year. The death-rate was 23.25 against 20.40 in August, 1895. Compared with the preceding month there was a daily average mortality of 402 against 408 in July; the *zymotic* mortality was less by 750 deaths, the decrease being in the deaths from ***diarrhoeal diseases,*** from which there were 2,326 deaths, or nearly 19 per cent of the total; a large number are reported from dysentery, affecting adults. There was also a decrease in the mortality from ***diphtheria,*** from which there were 257 deaths, a smaller number than in any month for the past ten years, August being generally the month of its smallest prevalence. *Scarlet fever* has almost disappeared from the reported causes of death, but 15 deaths being reported from the maritime district and 4 from the rest of the State. *Whooping cough* increased to 119 deaths; uniformly more deaths occur from this cause in August than in any other month, the average for the past ten years being 125 against an average of 90 for the other months of the year. There is the customary increase in deaths from ***typhoid fever,*** which caused 171 deaths, the average for the month. Of deaths from local diseases, the only material variation is in those of the digestive system, from which there were 200 fewer than in July. From the cause stated the reported mortality from accidents and violence is largely increased. The average mean temperature of the month was 1° above the normal, but during the first half there was a remarkably prolonged period of execessive heat; the mean highest temperature was 92°, while the mean lowest was 44°, and there was a mean relative humidity of 72 per cent., and in the eastern part of the State of 78 per cent. There was an unusual number of cloudless days, the mean barometer was 30.02, and the rain-fall generally deficient.

New York City, 1,995,000.—Report for August: Deaths, 4,497—1,831 under five years. Death-rate 26.55. Zymotic diseases, per 1,000, from all causes, 200.50; diphtheria, 104; typhoid fever, 42; consumption, 404; acute respiratory diseases, 298; diarrhoeal diseases, 643.

Brooklyn, 1,100,000.—Report for August: Deaths, 2,475—1,013 under five years. Death rate, 25.35. From zymotic diseases, per 1000, from all causes, 234.25; diphtheria, 67; typhoid fever, 28; consumption, 200; acute respiratory diseases, 141; diarrhoeal diseases, 424.

Buffalo, 335,709.—Report for August: Deaths, 470—254 under five years. Death-rate, 16.04. From zymotic diseases, per 1,000 deaths, from all causes, 410,65; diphtheria, 10; acute respiratory diseases, 45; consumption, 34; diarrhoeal diseases, 160.

Rochester, 160,000—Report for August: Deaths, 196—56 under five years. Death-rate, 14.70. From zymotic diseases, per 1,000 deaths, from all causes, 200.00; consumption, 27; acute respiratory diseases, 10.

Albany, 100,000.—Report for August: Deaths, 172—57 under five years. Death-rate, 20.64. From zymotic diseases, per 1,000 deaths, from all causes, 206; typhoid fever, 6.

Syracuse, 100,000.—Report for August: Deaths, 148—51 under five years. Death-rate, 17.76. From zymotic diseases, per 1,000 deaths, from all causes, 300; consumption, 16; acute lung diseases, 8.

NORTH CAROLINA.—George G. Thomas, M. D., President, Salem; Richard H. Lewis, M. D., Secretary, Raleigh.

September bulletin summarizes reports from 27 towns, with aggregate populations of 84,972 white and 60,863 colored, for the month of August: Deaths, 122 white, 140 colored. Death-rates respectively, 17.2, 27.6; 21.5. The chief causes were: From diarrhoeal diseases, 40; consumption, 30; typhoid fever, 34; malarial fever, 33; pneumonia, 2.

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus.

Cincinnati, 350,000: J. W. Prendergast, M. D., Health Officer, reports for September: Deaths, 395—120 under five years of age. Death-rate, 13.54 per 1,000. From diphtheria, 14; typhoid fever, 9; consumption, 46; pneumonia, 21; diarrhoeal diseases, 15.

Annual report for 1895.—Deaths from all causes, 6,096. Death-rate 18.14. Deaths from prevailing causes: Phthisis pulmonalis, 737; bronchitis, 321; pneumonia, 648; heart-disease, 308; diphtheria (and croup), 160; typhoid fever, 120; measles, 85; small-pox, 25; whooping cough, 38; diarrhoeal diseases, 286; cerebra-spinal fever, 31.

Cleveland, 330,279: J. L. Hess, M. D., Health Officer, reports for September: Deaths, 360—156 under five years; from diphtheria, 12; typhoid fever, 16; consumption, 28; pneumonia, 17; diarrhoeal diseases, 24. Death-rate, 13.26.

Toledo, 137,780: J. T. Woods, M. D., Health Officer, reports for September: Deaths, 140—63 under five years of age. Annual death

rate, 12.1 per 1,000. Form diphtheria, 2; typhoid fever, 8; consumption, 5; diarrhoeal diseases, 10.

"*Diphtheria* is raging all over the State" (Press, Cleveland) October 1st.—More particularly in *Cleveland*, where 48 cases had been reported during the first two weeks in October; in *Wayne township*, *Jackson*, and *Irvington*.

Typhoid fever is reported epidemic in *Bowling Green*, and in Claridon township, Miami county.

OKLAHOMA.—Dr. C. D. Arnold, Territorial Superintendent of Health, reports, is singularly exempt from contagious diseases. "During last autumn and the earlier part of the winter, diphtheria, with a few isolated cases of scarlet fever, prevailed in several towns and rural districts of the territory, but with a very small mortality, especially from the latter, and particularly during the spring months; measles existed in many counties, though fatalities from this disease were exceedingly rare. Otherwise than the above our territory has been quite free from infectious diseases among the people. Since December 1, 1894, I have been collecting, in a limited way in the absence of legal provisions therefor, information bearing on the kind and character of the prevailing diseases of our territory, their virulence, fatality and influence on age and sex, as compared with similar diseases east of 96 parallel longitude. More particularly has this inquiry been conducted to ascertain the comparative observations and views of our physicians who came originally mostly from the east of said meridian, relative to the climate of Oklahoma as a relief to persons suffering from bronchitis, asthma and incipient consumption. So far these inquiries have been eminently satisfactory. In the next biennial report I hope to present the results of these investigations."

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

Philadelphia, 1,188,793: Theodore B. Stulb, Health Officer, reports for four weeks ending September 26: 1,523—556 under five years of age. Deaths from diphtheria, 71; typhoid fever, 31; consumption, 173; pneumonia, 109; diarrhoeal, 96.

Annual Report for 1895: Births (exclusive of 1,495 premature and still births) 27,843. Birth-rate 25.63. Marriage reported, 7,708. Marriage-rate 13.24, or one person to each 75.49 of the population. Total number of deaths from all causes, 23,797. Death-rate 20.44. —Deaths from chief causes: from consumption, 2,449; pneumonia,

menced here last Monday without having the rooms scrubbed or in any manner disinfected. No attention has been given to cleaning or disinfecting the vaults. The school board even refuses to employ a janitor, and the teachers refuse to do janitors' work, leaving the rooms uncleaned. * * * * * Nearly every year we have epidemics of scarlet fever, diphtheria, whooping cough, measles, mumps and other things that interfere with the schools."

This statement is believed to be safely applicable to the schools of many other localities in the State.

Typhoid fever is reported prevalent in *Crown Point*. The milk supply is suspected.

Richmond: T. H. Davis, M. D., Health Officer, reports for the year ending April 30th, 1896: Total deaths, 255; of which 53 were under five years of age. Death-rate 12.0. There were 23 deaths from consumption, 15 from typhoid fever, 20 from pneumonia, 9 form diphtheria, 17 from meningitis and 13 from apoplexy.

"Special attention is given the matter of contagion in Richmond. With the able assistance of the Superintendent of Public Instruction, the school-room is considered quite secure from danger of infection. Aside from the disinfection of schools when required, upon the suspicion of indisposition of a pupil, it is at once sent home, only to return (in case of a contagious disease) upon the certificate of the attending physician, properly endorsed by the Health Officer. The indiscriminate use of pencils at school has been abandoned. The practice of collecting and distributing pencils, as heretofore practiced, has been fraught with danger, as children are prone to put pencils in the mouth, thus conveying disease from one to another. When library books are found at houses where contagious disease is present, the books can not be returned until disinfected by the Health Officer, and a certificate returned with the books establishing the fact, and in some cases of especial risk the books are destroyed. The Milk and bread tickets are a source of danger when handled by persons where contagion exists, and subsequently returned to the owner to be redistributed among the well. To avoid this danger, the inspector is instructed to take up and destroy all such tickets, and give a certificate setting forth the fact of their destruction, when those furnishing milk or bread continue to furnish the amount represented by the tickets destroyed."

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

Biennial Report of the Board for the fiscal period ending June 30, 1895: A volume of 380 pages comprehending the minutes of the meetings held; detailed work for the suppression of smallpox; special investigations of, and sanitary effort for the suppression and prevetion of diphtheria and tuberculosis, aetinomycosis and anthrax. Special reports and essays on quarantine, dissinfection, resuscitation of the drowned, resuscitation from lightning shock, water and water supplies, food value of fruit, house drainage, cisterns, school accomodations, and several other subjects of importance in sanitary administration. Legislation is urged for an efficient registrative law for the prevention of food adulteration, and appropriations to make such legislation effective.

Davenport, 31,484.—A. W. Cantwell, M. D., Physician, reports for September: Number of deaths, 27—9 under five years of age. Death rate per thousand, 10.9. Zymotic diseases caused 7 deaths, and consumption 4.

Diphtheria is reported prevalent throughout the State; more particularly in *Maquoketa, Salem, Manson, Dows, and Dubuque.*

KANSAS.—T. E. Raines, M. D., President, Concordia; T. Kirkpatrick, M. D., Secretary, Westphalia.

Phillipsburg, September 18th: The schools have been closed on account of an epidemic of diphtheria and children under 16 were prohibited from going on the streets.

KENTUCKY.—Joseph M. Matthews, M. D., President, Louisville: J. N. McCormick, M. D., Secretary, Bowling Green.

Covington, September 21st: *Diphtheria* is reported increasingly prevalent, over twenty-five cases at this date and causing considerable alarm.

Louisville, October 4th: *Diphtheria* is reported to be more prevalent than it has been for several years. The disease is also epidemic in portions of Marshall, Graves, and Harrison Counties. *Typhoid fever* is prevalent in Letcher county, attributed to the usual cause —polluted water.

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. F. Patton, M. D., Secretary, New Orleans.

New Orleans, 275,000—80,000 colored: Deaths in September, 452—colored, 158—138 under five years of age—42 colored. Deaths from consumption, 54; pneumonia, 14; bronchitis, 19; *small-pox*, 1; cholera infantum, 7; enteritis, 11. Death rates: Whites 18.09; colored, 23.70: 19.72.

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TRANSACTIONS OF THE AMERICAN CLINATOLOGICAL ASSOCIATION FOR THE YEAR 1896.—Philadelphia: Guy Hinsdale, M. D., Secretary. A volume of 300 pages comprehending twenty-five stated papers and a special report upon Health Resorts. The papers, for the most part, discuss the advantages of the western high altitudes for consumptives, and with but little reference to the contagiousness of consumption. Dr. Vincent Y. Bowditch, of Boston, protests against the unreasonable and often cruel attitude taken by the laity, and even physicians, in their desire to prevent the spread of the disease. Under the title of *A Plea for Moderation in Our Statements Regarding the Contagiousness of Pulmonary Consumption* he cites several instances illustrative of unnecessary and sometimes cruel prohibitory rules of hotels and sanitary resorts against the admission of consumptives, and the needless fear of people to dwell in the vicinity of carefully conducted sanitariums.

A Rational Basis for Prophylactic Measures Against Pulmonary Tuberculosis, by D. H. Bergey, M. D., of Philadelphia, very effectually disposes of the alleged communicability of consumption by any other means than the dust of dried sputa, or possibly by the moisture in the act of kissing. Numerous experiments are cited showing negative results only, with the collected moisture of the breath of consumptives, even from those with extensive cavity formations. But the utmost care is inculcated with regard to the disposal of the sputa of consumptives—the danger of spitting in handkerchiefs or on floors where it is liable to dry and the dust to be scattered. The danger of the clothing and bedding used by consumptives is also pointed out, and the good results in the care of consumptives under the exercise of such precautions.

The advantages of particular localities reported upon are based upon the freedom of the air from impurities, with perhaps too little attention to the domicile, ever liable to the danger of too much fear of taking cold by consumptives and consequent neglect of an abundance of fresh air—the most essential condition under all circumstances.

The relation of climatic to some other diseases discussed is, to say the least, obscure.

The Report of the Committee upon Health Resorts is good as far as it goes, but that is not very far. As the committee states—it is difficult to collect reliable data regarding resorts which will be of service to the physician at large. Indeed, it is almost impossible except by actual observation, so apt are those who occupy them to

have partial knowledge only. However, we are glad to know that it is proposed to continue the effort from year to year as information can be obtained (and sifted), and all members of the association are urged to co-operate with the committee in their exertions to discover health resorts, and the names of reliable persons at them with whom to communicate are especially desired. V. Y. Bowditch, M. D., Boston, Mass., Chairman of the committee.

THEATRE FIRES AND PANICS; THEIR CAUSES AND PREVENTION. By William Paul Gerhard, C. E., Consulting Engineer for Sanitary Works. 12mo. cloth, $1.50. New York: John Wiley & Sons.

This book is the reproduction of several essays by the author on the subject which it discusses during recent years, that have attracted such attention as to fully justify their substantial condensation. It comprehends statistics of theatre fires and the defects which have lead to them; the essential conditions of safety in the plans and construction of theatres; the water service and fire protection of theatres. It fills an important place in the literature of life-saving measures, too much neglected heretofore, and we take much pleasure in commending it to architects, engineers, theatre managers and underwriters as a book of much practical utility.

CHEERFUL PHILOSOPHY FOR THOUGHTFUL INVALIDS. — By William Horatio Clark. Price 50 cents. Reading, Mass.: E. T. Clark & Co.

A brochure of forty pages in admirable correspondence with the title. It is alike commendable to the well who would have their minds imbued with ever-ready thoughts helpful to the afflicted, and to invalids who would be ever alive to thoughts conducive to comfort—the stimulus of hope.

CONTEMPORARY LITERATURE.

LONDON'S WATER SUPPLY.

The water-supply system of London is a capital instance of the superhuman patience with which Englishmen endure the shortcomings of officialdom. The London county council, unlike the other municipalities of the kingdom, has nothing to do with water. Parliament has created a monopoly and the metropolitan ratepayer is helpless. His water is supplied to him by eight private

companies, whose united efforts provide 31 gallons a day per head, whereas a sufficient supply is estimated at 35 gallons. Of these companies the East London is the worst. The East London Water Company is constantly being taken by surprise. In the hard winter of 1894-95 it complained of the cold. In the fine summer of 1895 it complained of the heat, and this year it practically gave up all attempt to supply its customers with what they bargained for. A water famine in the east end is an annual event, and in time perhaps the tardy London rate-payers may wake up to the danger of their apathy and indifference. Almost every town of any size in the kingdom owns its own water works and provides about forty gallons a day per head, with ample reserves in the case of drouth. Only London accepts an uncertain 30 gallons a day from monopolist companies, one of the largest of which frequently fails to maintain its supply. The other towns have sought pure water at spots far removed from habitation; London continues to draw its supply from the polluted valleys of the Thames and the Lea. The other towns are looking ahead and making ample provision for increase of population and consumption; London being so much occupied with the helplessness of the present, has not turned a thought toward the future. All her inhabitants can do is to pay their rates and be thankful for such water as they can get.—*Harper's Weekly.*

THE NEED FOR SLEEP.—By far the most important compensation for all effects of fatigue is sleep. Everybody, even the man mentally most inert, develops when awake a mass of mental effort which he cannot afford continuously without suffering. We need, therefore, regularly recurring periods in which the consumption of mental force shall be slower than the continuous replacement. The lower the degree to which the activity of the brain sinks, then the more rapid and more complete the recovery.

The mental vigor of most men is usually maintained at a certain height for the longest time in the forenoon. The evidences of fatigue come on later at this time of day than in the evening when the store of force in our brain has been already considerably drawn upon by the whole day's work. If no recovery by sleep is enjoyed, or it is imperfect, the consequences will invariably make themselves evident the next day in a depression of mental vigor as well as in a rise in the personal susceptibility to fatigue. The rapidity with which one of the persons I experimented upon could perform his tasks in addition sank about a third after a ni[illegible]way with insufficient sleep. Another experim[illegible]

effects of keeping himself awake all night in a gradual decrease of vigor lasting through four days. This observation was all the more surprising because the subject was not conscious of the long duration of the disturbance, and was first made aware of it incidentally by the results of continued measurements on the causes of the manifestations of fatigue.—From "A Measure of Mental Capacity," by Dr. Emil Kraepelin, in Appletons' *Popular Science Monthly* for October.

ELECTRIC LIGHTING, HEATING AND COOKING may be illustrated in a very simple way. If you put a poker in a hot fire, the heat motion of the fire will start the iron particles into heat motion and make the poker hot. At first it remains black, although even then it gives out heat; presently, in a very hot fire, it becomes white hot and gives off so much light as well as heat that you can read by it in the dark; if it gets still hotter it will melt. But if the poker is a hollow tube and has water in it, the heat will be conducted through the iron into the water and the water will boil. Or, if the hollow iron is connected with other pipe and water passed through, the heat will be carried off by the water flowing through without its boiling; and if the tube is removed from the fire, instead of being white hot it is only warm. Now, when electricity flows through a sufficiently large wire, the current is conducted away without heating. When it flows into a wire too small, the current heats the wire, and unless the heat is carried off by radiation, the wire melts. If carbon is used instead of wire, it becomes white hot, and we have the electric light. In one case the heating is external, from the fire without; in the other it is external, from the current within —and this is a chief difference.—From "Electricity," by R. R. Bowker, in *Harper's Magazine* for October.

THE GREAT INCREASE OF CITY POPULATION.—More than one-third of the entire population of these United States now live in cities. In some States it is much greater: in Massachusetts, 70 per cent.; in New York, 60 per cent.; in Connecticut, 54 per cent.; in New Jersey, 52 per cent. In 1790 there were but six "cities"—*i.e.*, having a population of more than 8,000—in 1890 there were 448 such cities. In 1840 there were but three cities with more than 100,000 inhabitants; in 1890 there were twenty-eight such cities. In 1870 there was no city having 1,000,000 inhabitants; in 1890 there were three such cities. In 1896 the new New York is estimated to contain 3,200,000 inhabitants, or nearly as many as the thirteen United States when George Washington took the oath of

office as first President.—From "The Government of the Greater New York," by Col. F. V. Greene, in the October *Scribner's.*

MENTAL EPIDEMICS PAST AND PRESENT.—In looking back to the medieval ages, we find them to be times in which abnormal social phenomena were displayed on a grand scale—times teeming with mobs, riots, revolts; with blind movements of vast human masses; with terrible epidemics that ravaged Europe from end to end. They were ages peculiar for the strange, striking fact that whole cities extensive provinces, great countries, were stricken by one disease. Men went mad in packs, by the thousands. An obscure individual in some remote country place had fits of hysterics. and soon all Europe was wriggling and struggling in convulsions of hysterical insanity. The dark ages were strange, peculiar—so, at least, do they appear to us, who consider ourselves vastly superior to the poor, ignorant medieval peasant, burgher, knight, with their superstitious religious fervor, and recurrent epidemic insanities. I am afraid, however, that a similar fate may overtake us. May not a future historian look back to our own times with dismay, and perhaps with horror? He will represent our age as dark and cruel—an age of the blind, senseless Napoleonic wars, of great commercial panics, industrial crises, Black Fridays, Coxey armies, and mobs and crazes of all sorts and descriptions.—"A Study of Mental Epidemics," by Boris Sidis, in the October *Century.*

DR. BARNARDO'S WORK.—W. T. Stead, in the August number of the *Review of Reviews,* thus graphically writes: "It is idle to attempt to describe all that Dr. Barnardo has done and is attempting to do. He is a center of spiritual, social, intellectual activity, perpetually in motion. He began by caring only for the saving of the city arab; he now finds the whole social problem on his hands. He is facing the vast complicated congeries of difficulties which baffle churches and governments, and facing them also with marvelous success. Round his Homes have grown up a veritable church militant, the most amazing octopus of our time. Nothing that is human is alien to Dr. Barnardo. He imports cargoes of timber from the forests of Norway, and plants out human seedlings in the prairies of Manitoba. He is surgeon, editor, preacher, teacher, jack-of-all-trades, and a past-master in all. One day he brings 3,700 children from all his Homes to the heart of the West End. It is a small army—a larger army than that with which Britain has won many of her most brilliant victories. Under his

able direction they concentrate at the Albert Hall to meet the Prince and Princess of Wales, bringing with them a vast paraphernalia illustrative of all their enterprises, their works, and their sports. With a skill the late Sir Augustus Harris could not have excelled, he puts this gigantic troupe through a program lasting nearly four hours, a program that goes without a hitch, that keeps everyone from the Prince to the pressman enthralled in unflagging interest, and that fascinates and delights everyone, with one of the prettiest spectacles ever seen in London. And the troupe, what is it? One and all they are children, some mere babies, but all, whether old or young, perishing fragments of shipwrecked humanity, snatched one by one from the maelstrom of our cities. But for him these little ones would have been in the workhouse, in prison, in the grave, or, worse still, in the kennel and in the slums preparing, before they were well in their teens, to perpetuate their kind. And then, after having given the world this gigantic object-lesson in organized philanthropy, the company disperses. The mammoth troupe of 3,700 silently and swiftly retrace their steps. As was the concentration, so is the distribution. In twelve hours all is over, the Homes are again full of teeming life, and not a child has been lost or has even missed its way. Those who have attempted to convey a party of a score of boys and girls from the circumference to the center of London in mid season alone can appreciate what was involved in the march of the 3,700 to and from Albert Hall."

TARTAR MEDICINE.—Formerly musk was used as a medicine in various parts of the world; but doctors in civilized lands do not hold musk in high repute. In China it is still thought to be a very good medicine; but the Chinese have queer notions about cures and charms. Abbe Huc, a distinguished traveler, says that when a Tartar doctor finds himself without his drugs and medicines, he is not in the least embarrassed. He writes the names of the needed drugs on slips of paper, and these, being rolled up in little balls, are swallowed by the sick man. "To swallow the name of a remedy, or the remedy itself," say the Tartars, "comes to precisely the same thing."—"The True Story of Marco Polo," by Noah Brooks, in October *St. Nicholas.*

"A newsboy saw a dime lying on the ground in the City Hall Park. A tramp sitting on a bench nearby saw the boy pick up the piece, and claimed it at once as his own.

"Your dime did not have a hole in it, did it?" asked the boy.

"Yes it did," said the tramp; "give it up!"

"Well, this one has not got any hole in it, so I guess I'll keep it." —*Harper's Round Table.*

The *Review of Reviews* for October continues its admirable record of the Presidential campaign. The frontispiece is a portrait of Sir JOSEPH LISTER, the eminent British surgeon, whose discovery of the value of antiseptics has so revolutionized modern surgical methods, and who was honored, last year, by election to the presidency of the British Association for the Advancement of Science. Another interesting picture in the October *Review* is a photograph of Mr. Gladstone and Li Hung Chang.

The Living Age has anticipated the new year by the addition of a *Supplement* beginning in November, containing three departments, namely: Readings from American Magazines, Readings from New Books, and a List of the Books of the Month.

This "Supplement," which cannot fail to be of great interest and profit to its subscribers, will add about *three hundred pages* annually to the magazine with no addition to its present price—$6.00 a year. The Living Age Co., Boston, Mass.

The Charlotte Medical Journal, though less than five years old, has gained the front rank among medical monthlies and the foremost place among those of the Southern States. The proprietors have recently expressed their appreciation of the generous patronage they have received by additional inducements—increased the size of the page and divided it into two columns, consequently adding to the amount of the excellent matter with which it is filled. 96 textual pages monthly. Subscription, $2.50: Charlotte, N. C.

Change of Name.—The editors of Mathews' Medical Quarterly announce that with the January issue of that publication its name will be changed to "*Mathews' Quarterly Journal of Rectal and Gastro-Intestinal Diseases.*" There will be no change in the policy of the journal. It is the only English publication devoted to disease and surgery of the rectum and gastro-intestinal tract, the articles which will appear in it will be limited to these subjects. The journal will continue to be edited by Drs. J. M. Mathews and Henry E. Tuley, and published in Louisville, Ky.

THE SANITARIAN.

DECEMBER, 1896.

NUMBER 325.

PROGRESS IN SANITARY ENGINEERING.*

By SIR ANDREW NOBLE, K.C B., F R S.

In the course of his remarks on this subject the president said he was not an expert, and they would forgive him if he spoke on general rather than on special subjects. Although an engineer, he had never devoted special attention to that branch of engineering with which the congress was more immediately concerned. He said "special attention" advisedly, for no man of ordinary intelligence could avoid paying some attention to such vital questions as were involved in sanitary engineering. Indeed, the strides which had been made by that science in recent years were so remarkable as to thrust themselves upon the notice of even the most careless or the most absorbed. He was old enough to claim to have seen the very beginnings of sanitary engineering, in the modern sense of that term, for he thought they might fairly attribute its inception to the passing of two measures in 1847 and 1848—the Town Improvement Act and the Public Health Act. Certain architects, engineers and mechanics were then led to devote special attention to the practical methods of ameliorating public health, and proved to be the forerunners of the sanitary engineers as we had them today—a class as necessary, as able and as much appreciated as any in the community. Before that time no serious attention had been given to sanitation. Everything that was done in that direction was done by rule of thumb, and, if sanitary improvements were made at all, it was only in special instances, where abominable smells or virulent outbreaks of disease forced the hands of those in authority. Commissions appointed after the passing of the acts in question, to inquire into the causes of the terribly high death rates

* Address as President of the Section of Engineering and Architecture of the Congress of the Sanitary Institute, at Newcastle-on-Tyne, September 8, 1896.

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The Woman's Health Protective Association have just reason to take pride in the prospective result of their work. The Association has now begun a crusade against foul bakeries, and the Sunday work of the employes.— Fully two-thirds of the shops, it is said are operated on Sunday, although it is shown that this is entirely unnecessary by the fact that the remaining one-third still prosper, although in these no Sunday work is done.

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new water company, called the Subscription Water Company, came upon the scene. The company's works were completed and came into operation in November, 1835. So Newcastle had for the first time two water companies. Competition was very sharp, and brawls between the workmen of the rival companies not unfrequently enlivened the monotony of the streets. But this state of affairs was of short duration, for, in 1836, the older company gave way, and sold all their works to the Subscription Company for £16,000. In 1801 the population of Newcastle was 28,000, in 1821 it had increased to 35,000, but in 1841 it was 70,000. The Subscription Water Company seemed to have done a good deal to keep pace with the growth of the population, but they hardly grasped the situation, and in the beginning of 1845 a very formidable rival threatened them. This was a company formed to supply Newcastle with water from a reservoir in Whittle Dene, about thirteen miles from Newcastle, where the water of the Whittle Burn was collected by damming. The formation of that company was due to Lord Armstrong, who not only suggested the works, but in the early years of the company gave it his powerful support. As the Fire Office Company had given way to the Subscription Company, so the Subscription Company in its turn gave way, and sold their undertaking to the Whittle Dene Company for £35,000. This last association finished its works in 1848. Five large reservoirs were formed in Whittle Dene, with a capacity of 215,000,000 gallons, and Newcastle was supplied from them by a 24-inch pipe. This was the first really comprehensive scheme, and it would be useless for him to trace in any detail the development of the water supply further from that time to this. It was merely the history of occasional failures of water and consequent grumbling, of an earnest endeavor on the part of the company to keep pace with the extraordinary growth of the town by adding reservoir to reservoir, and of the gradual elimination of Tyne water from the company's system except for manufacturing purposes. In 1848 the reservoirs contained 215 million gallons, and the daily water consumption was 1½ million gallons. In 1857 the storage capacity had increased to 525 million gallons and the consumption to 3¼ million gallons daily. In 1876 the daily consumption reached 8¼ million gallons. Recently the consumption had increased at the rate of 500,000 gallons a day each year, until it was now about 16 million gallons. The population supplied by the company was 400,000, and the present storage capacity was 3,065,000,000 gallons. Large as the company's reservoirs were they had proved insufficient, and an addi-

tional reservoir was in process of construction on the Rede which would bring the storage capacity to over 5,000,000,000 gallons.

SOMETHING WRONG WITH THE DRAINS.—If our houses presented a great contrast with those of his youth in bath accommodation, they presented an equally favorable contrast in their arrangements for dealing with sewage. The water closet of former days was an evil thing, with complicated gear which was constantly getting out of order, and so boxed in with wood that it could not readily be got at. In most cases it was a disseminator of foul gases through the house and a fruitful source of disease. How common an experience it used to be for such of them as had large families to find some of the household ailing, and on sending for the doctor to receive the gratifying assurance that something was "wrong with the drains." No care could insure the proper working of the defective appliances, which were all that they had at their command in those days. It had been pointed out that the typhoid which scourged the highest and wealthiest families in the kingdom was probably attributable to the fact of their sleeping apartments being fitted with such places in close proximity. All was now changed. The cry of "something wrong with the drains" was heard much less frequently, and an outsider like himself could not fail to be struck with the evidences of anxious attention and clever design exhibited in these commonplace but very necessary appliances. In such matters as ventilation and warming enormous progress had been made. Warming with hot water, which in the South of England was more or less of a luxury, was in this colder climate almost a necessity if large houses were to be maintained in winter at a comfortable temperature. Wall papers, cooking ranges and beds were all topics which tempted him to speak further.

HOUSE ACCOMMODATION.—Mentioning beds reminded him of the enormous improvement that had, during his lifetime, been made in the sleeping accommodation of an average house. In even the larger houses of a former date everything was sacrificed to the so-called reception rooms. The sleeping accommodation was altogether starved, the bedrooms for the family were small and ill-ventilated and those for the servants disgraceful. One often wondered, in looking through well-known houses at the end of the last century and the beginning of the present, how the large gatherings of friends that certainly took place there were ever accommodated. Such houses seemed large enough outside, but when it was attemped to allot bedrooms to visitors, the bedrooms were found far too few, and, with some exceptions, far too small for modern re-

quirements. He fancied that the explanation of such anomalies was that our ancestors were content with very modest washing accommodations, and that, in the case of men, at least, and probably of ladies, too, each bedroom did duty for several occupants. A mattress on the floor or any other "shake down" was as much as an ordinary bachelor or spinster expected on a country visit at Christmas or other generally festive season. He remembered a passage in George Eliot's "Silas Marner" describing the heroine's visit at Christmas to the squire's house, which he ventured to quote: "There was hardly a bedroom in the house where feminine compliments were not passing, and feminine toilets going forward in various stages, in space made scanty by extra beds spread upon the floor, and Miss Nancy, as she entered the blue room, had to make her formal little courtesy to a group of six." In Miss Burney's "Evelina" two daughters of a well-to-do silversmith were driven to dress somewhat hurriedly in the drawing room before their guests arrived. As for the servants, they slept as they could, huddled together in tiny rooms, in cupboards or in the space under the stairs, in boxrooms or in any other recess that would contain a mattress. The country houses of Northumberland, so far as he had opportunity of judging, were bad in their servants' accommodation, though he had no reason to think they were worse in that respect than those of other countries. Modern practice had greatly improved these matters, and a much better balance was now observed between the living and sleeping rooms of a large house. He was inclined to think that we erred, if anything, in devoting too much attention to our sleeping rooms, and were carrying a good theory to a fad in demanding that they should be so spacious and elaborately furnished.

In conclusion, he would say that, though the details of sanitary improvements seemed often petty or commonplace, they should not therefore be led to think them unworthy even of master minds. The general result was as vast and far-reaching as the details out of which it was built up were trivial and unromantic. Who should say that a vast field was not open alike to the man of science, to the physician and to the philanthropist when he read a passage like the following: "The probable length of life varies extremely in different surroundings. In Switzerland it is at birth forty-one years, in England twenty-eight in France twenty-one; but in Paris it is only eight years, in London three years, in Berlin two years and in Vienna less than two years. Such is the tax levied by our great en-

emy Death on the misery and the immorality of our great towns, and the tax is paid almost entirely by the rising generation." It was more than fifty years since that passage was written, and he regretted that he was not in a position to give similar figures for the present day. There was always great difficulty in making accurate comparisons of that nature, because the tables from which the figures were derived were not always obtained by identical methods. In England, he believed, the probable length of life had risen from twenty-eight to forty-five years, and doubtless in the other localities named a great improvement had taken place, but, though much had been done to improve the conditions of life, much yet remained to be done. But he drew their special attention to the passage he had quoted because, as they would have observed, the difference in the probability of life in town and life in the country was enormous. The less population dwelt in towns the greater at birth was the probability of life. In Sweden, for example, the probable life at birth was fifty-one. Lord Percy, in his most suggestive address, called attention to the continuously decreasing population in the country districts and to the continuously increasing population of the towns. He (Sir Andrew) confessed that this important subject did not appear to him to receive the attention it merited. To adults, no doubt, it made little difference whether they lived in town or country, but the figures he had quoted showed the effect on the death rate of the young. Death was not the only evil. Enfeebled constitutions and loss of physique, in time affecting the whole race, was the infallible consequence of placing a large majority of the young in the midst of unhealthy surroundings. There was one other subject to which he must call their attention. His recent travels in the East brought him in contact with men who convinced him of the magnitude of the evil. An evil which sapped the efficiency of the British army in India and permanently injured the health of a large portion of the rising generation was surely a proper subject for the inquiry of the highest sanitary authority in the kingdom. Politicians, he feared, could hardly be expected to move in the matter, unless their duty was made plain to them by such a body as that he was addressing. It was the fashion among school men to divide knowledge into two classes—human and divine. To them all knowledge was divine, and never more divine than when it was busied with the efforts to lessen, however slightly, the sum of human misery, or to increase, however slightly, the sum of human happiness.

MORTALITY AMONG THE NEGROES.

THE SANITARY PRIVILEGES TO WHICH THEY ARE ENTITLED FROM THE AUTHORITIES.

By J. C. LE HARDY, M.D., of Savannah, Ga.

The high rate of mortality among the negroes in cities along the South Atlantic and Gulf coast has been a source of great annoyance to municipal boards of health because their endeavors to reduce it have always failed.

On account of incorrect representations the great majority of our people has come to believe that this excessive death rate is due to peculiarities of the race, and that it cannot be helped. But an examination of the mortuary records kept before the emancipation of the slaves will show that the ratio of deaths among the negroes was noticeably below that of the whites. This is clearly brought out in the following table, part of the "tabulated mortuary records of Savannah," by Dr. William Duncan:

RATIO OF MORTALITY PER THOUSAND.	*Whites.*	*Blacks.*
1854	97.9	34.3
1855	32.0	30.1
1856	32.0	29.6
1857	24.1	25.0
1858	35.5	23.6
1859	24.3	23.5
1860	25.3	23.2
1861	28.4	21.2
1862	26.6	28.2
1863	20.9	28.3
1864	32.6	31.2
1865	50.1	55.4
1866	21.2	59.6
1867	18.3	37.5
1868	18.3	35.5
1869	15.0	25.4

When the negroes were slaves it was to the interest of their owners to keep them under strict sanitary regulations. Their quarters were clean and well ventilated; they had regular hours for work, for sleeping and eating; their food was simple, wholesome and well cooked; they were not allowed to get drunk, and marriage was insisted upon. Lying-in women were tenderly looked after by the

mistresses or by the overseer's wife. Carefully trained women nursed the sick and looked after small children. Personal cleanliness was required, and in case of sickness the best medical attention was procured. While living under these regulations the negro was sturdy and healthy, consumption and syphillis were rarely met with and many reached a remarkable old age. When toward the end of our civil war, the enemy over-ran the southern coast, the negroes left their comfortable homes to follow the army. Without means, without provisions or shelter, they gathered pell-mell in great numbers. Want, misery and hunger forced them to perform the most abject services. The intermingling of the sexes without restraint lead to the most revolting licentiousness.

Syphillis spread like wild-fire, and smallpox made fearful ravages among them. Exposure, disease and the lack of proper food depressed their vital powers, consequently the generation which followed emancipation was a weakly one. Lung diseases were the fruits of this physical weakness and of inherited syphillis; and to this day consumption and pneumonia carry off the greatest number.

When the freedom of the slaves was proclaimed, no provision having been made by the general government to help them, these poor people were thrown upon their own resources, and they had no time nor opportunity to indulge in any sanitary of other comforts. Working by day and often by night, they could barely secure money enough to feed and clothe themselves. Thousands only had clapboard or mud houses for shelter, or they huddled together by the dozen in rooms barely large enough for one. Had they been subjected to all these privations in Northern or Western States, but few would have survived the ordeal. Since that time the more intelligent and thrifty of the race have made wonderful progress. Many, through the educational facilities provided for them, or through economy, have been able to acquire enough property to surround themselves with many of the comforts of life. In this class the mortality is no greater than among the whites, because they fully appreciate the value of sanitary surroundings; they observe personal cleanliness, keep regular habits and eat wholesome food. But the great majority of these people, the laboring class, live from hand to mouth, spend the greater part of their wages before they are earned, eat irregularly, gorging themselves at night, going to work early in the morning on an empty stomach; they buy their meat and vegetables where it can be gotten cheapest, whether good or spoiled; many spend their nights

gambling and drinking, others shouting and praying. The wives are obliged to work out to help feed the family, so that the younger children are left to the care of other children, or superannuated women, and they are stuffed with coarse food, badly clothed, out in all sorts of weather, and kept filthy in their persons and surroundings. Pregnant women are left at the mercy of ignorant and unscrupulous midwives, at whose door may be placed the excess of abortions and still-births. These people live in small tenement houses or in old shanties, fit only to be burnt—concentrated in the most unhealthful localities, with dampness underneath and foul air above, and no means of ventilation. And if to this we add immoral habits and other excesses and the lack of medical attendance when sick, there is no wonder that the death rate is excessive among them. When their mortality was below that of the whites no suggestion was ever made of separating the races in official reports, but as soon as it reached proportions which made Savannah rank with cities whose mortality is excessive, our sanitary authorities, instead of trying to remedy the evil by the enactment of new sanitary laws and by enforcing existing ordinances, endeavored to cut the gordion knot by separating the colors; but this artifice could not be so readily palmed off upon rival cities.

The negroes are part and parcel of our population to-day, as well as when they were our slaves. It was the duty of the master to protect and take care of them then, but the moment they acquired the rights of citizens it became the duty of our city fathers to do so. And what can they do for the welfare of this class of people? How can they reduce the excessive mortality among them? It seems to me that the authorities could easily reduce the death rate and protect these people without increasing the expenses of the city. They could prevent, under heavy penalty, the building of more than four houses upon a lot 60 or 62 feet front; require for each house an open space (yard) fully twice the area of the house; make it obligatory to leave an empty space between every second house; require that lots shall be thoroughly drained—or filled before issuing building permits; that every wooden dwelling house shall be put upon brick posts at least 18 inches from the surface of the soil, this space to remain open for the free access of air; that no living or sleeping room shall be made smaller than 12 by 10 by 10, with a fireplace or ventilation flue opening; forbid, under heavy penalty, the use of privy vaults; require landlords, where connection with sewers is impracticable, to build closets in such a manner that the

pails can easily be removed and replaced by the scavenger, and forbid also that closed wooden or brick fences be placed around or between yards. Such an ordinance, if rigidly enforced, would stop the building of ten or more houses, with as many vaults, upon a single lot. The free circulation of pure air would in a measure prevent the loathesome and stifling smell in summer and greatly diminish that class of filth diseases so fatal among the poor and the squalid.

The authorities could bring about much improvement by beginning a stricter police supervision over the sale of meats, vegetables and fruits. The poorer people buy the worst quality of these, and often eat them when partly decayed; this is the cause of those diarrhoeal diseases that carry off so many children among the poor.

By a policy of continually appointing as city physicians men of ability and experience and extending their duties, requiring them to give all their time to practice among the poor and to co-operate with the health officer in the abatement of nuisances, the enforcement of cleanliness, of ventilation and proper nursing in the sick room and around the house. It should be their duty to investigate every case of abortion and of still-birth, with a view to their prevention. They should be liable to pay fines and to dismissal for neglect of duty.

By making it a crime, punishable with fine and imprisonment, to harbor a sick person without calling for medical aid.

By punishing any person convicted of practicing midwifery without license to a long term of imprisonment, and by appointing a board of physicians who should be intrusted with the duty of giving licenses to practice midwifery to such persons only as are able to pass creditably a written and an oral examination upon that branch of medicine, which would prevent hundreds of deaths from abortion, from still-births and from trismus.

Such ordinances, if rigidly enforced, would effectually remove the principal causes of excessive mortality among negroes, without putting any additional burden upon the city. Then, by requiring all physicians and midwives to report every birth, every death and every contagious disease to the health officer, there would be no further reason why a health bulletin should not be issued here every month, as it is done in other cities, that the people may be informed of their relative vital statistics to other communities.

SAVANNAH, Ga., Nov. 9, 1896.

FORMIC ALDEHYDE: ITS PRACTICAL USE AS A DISINFECTANT.*

By F. C. ROBINSON, M.D.,
Professor of Chemistry at Bowdoin College, Brunswick, Maine.

To those engaged in public health work, no argument need be presented to prove the pressing need of an efficient gaseous disinfectant, which can be conveniently and safely used, which will destroy all dangerous germs and not injure clothing, paper or other substances which may be present.

Hitherto, sulphurous acid has most nearly met these requirements, but far from perfectly. In the first place, it has little or no germicidal action unless in presence of moisture, and in the second, it so rapidly oxidizes to sulphuric acid that paper and fabrics are frequently injured by its use. Then, too, it acts so powerfully upon the lungs, that rooms in which it has been used are for a considerable time uninhabitable.

So serious have been the evils associated with sulphur fumigation that some health boards have given up its use, preferring to rely upon soap and water, bi-chloride of mercury, and other liquid disinfectants, notwitstanding the inconvenience attending their use in disinfecting a room.

In view of these conditions, it has been with more than passing interest that we have read of the recent experiments with the material called formalin, but known in chemistry as methyl aldehyde, or formic aldehyde. The remarks of Dr. Kinyoun at the Denver meeting of this association stimulated this interest still more, and probably at this time very many of you have personal experience with it to relate. Very early in the past year the Maine State Board of Health authorized me to conduct a series of experiments to determine, if possible, the practicability of its use as a gaseous disinfectant by local boards of health. It is the nature and result of these experiments which I shall give in this paper.

It was not the design of the board to have me simply verify or disprove the antiseptic properties of formic aldehyde. We could not but have confidence in the work done in foreign countries bearing upon this point. The main question was, can this material be

* Read at the Meeting of the American Public Health Association, Buffalo, N. Y., September 17. 1896.—From *The Journal* of the Association, October No., 1896.

put into the hands of local boards of health, so that we can have confidence in their results? It is one thing to use a material in a scientific laboratory and an entirely different thing to use it in a tenement-house. The professor of hygiene and the average member of local boards of health are naturally different in mental equipment.

Early in my investigations I became impressed with the fact that the successful use of formic aldehyde as a general room-disinfectant necessitated the formation of very large quantities of it in a short time, and that this must be obtained in a comparatively dry condition.

It is well known that the commercial formic aldehyde, sold also under the name of formalin and other proprietary names, is a water solution of the gas, containing about forty per cent. of the pure substance. This smells strongly of the aldehyde, and in small spaces can be readily used as a source of the gas by pouring it upon sponge or cloth and allowing it to evaporate, which it very readily does.

By so treating a large room, say fifteen feet square, it can be filled with the gas, using, of course, large quantities of the solution. But for some reason the penetrating power and disinfecting action of the gas so prepared, at least in my experiments, is not satisfactory. I do not suppose that the gas is any different in such a case, because in a small space it is perfectly effective, but I imagine that coming off as it then does, loaded with moisture and cooled by the process of evaporation, it is more sluggish in its movements and penetrates less readily all parts of the space.

It is also true that the use of a very large amount of the solution involves considerable expense.

I next turned my attention to proposed methods of generating the gas directly. This part of the subject has not been neglected by foreign workers.

I will say, by way of introduction to it, that the word aldehyde in chemistry is a class name. There are a great many substances to which it is given. In general it is an alcohol dehydrogenated; hence the name al-de-hyde. As a rule, an alcohol becomes an aldehyde when, by action of oxygen in limited amount, it loses two atoms of its hydrogen. Methyl aldehyde, ethyl-aldehyde, etc., are thus derived from methyl and ethyl alcohols. But because the aldehydes very easily change into acids they more commonly take their names from the resulting acids, and hence the above aldehydes are called formic and acetic.

The chemical formulae show very clearly the change. Thus methyl alcohol C H^3 O H becomes by loss of hydrogen C H O H, formic aldehyde, and that, by addition of oxygen, becomes C H O O H, formic acid.

Methyl alcohol is made from dry distillation of wood, and used in the arts under the name of wood-spirit or wood-alcohol.

The change of an alcohol to an aldehyde may be brought about in a variety of ways. In the making of vinegar a portion of the alcohol is generally changed to aldehyde spontaneously. Alcohols heated with certain higher oxides, as of chromium and manganese, are changed to aldehydes. But the most successful and easiest way of making the two above-mentioned aldehydes is to expose the vapors of the corresponding alcohols, mixed with air, to red-hot platinum. In this way formic aldehyde was first made by Hofman, in 1867. The process can easily be seen by suspending a spiral of thin platinum wire or small piece of sheet platinum over the wick of an ordinary spirit lamp. If the lamp be lighted and then quickly extinguished, the platinum will continue to glow and the aldehyde odor become manifest. This will produce, of course, formic or acetic aldehyde, according to the alcohol used—common alcohol giving acetic aldehyde, wood-alcohol giving formic aldehyde. It is upon this principle that lamps have been devised by several foreign scientists to make formic aldehyde for room disinfection. Gambier and Brochet describe such a lamp in the *Revue D'Hygiene*, February 20, 1895. The wick is made as large as possible, and a cone or cap of platinum, perforated, is put over it. The oil is held in a tank at one side, on the principle of a student lamp. With this lamp 100 c. c. of methyl alcohol can be changed to formic aldehyde in an hour. As this is not rapid enough to disinfect ordinary rooms, they had batteries of lamps constructed so that with eight of them 800 c. c. per hour could be changed.

Tollens, in the *Bericht der Deutschen Chemischen Gesellschaft*, describes a lamp on the same general lines, but without the air regulator chimney and tank. It seems to be an ordinary spirit lamp with a cone of platinum gauze over the wick.

Trillat, in the *Revue D'Hygiene* for August, 1895, describes a large lamp in which ceveral liters of the alcohol were vaporized by heating the copper cylinder containing it, and the vopor made to pass though capillary openings, and then mixed with an air impinge on hot platinum, or copper, or platinized asbestos. He was enabled to change six liters of alcohol to aldehyde in a few hours.

But, of course, this lamp or apparatus required an arrangement for boiling the alcohol.

Dr. A. Diendonne, in the *Arbeiten aus dem Kauserlichen Gesundheitsamte*, third part, 1895, describes a lamp devised by himself and Herr Krell, in which the ordinary soldering lamp of the plumber has a platinum cylinder attached to it, so that having first been kindled in the usual manner and the platinum heated, it is then extinguished, and the platinum causes the change into aldehyde to continue as long as the lamp contains alcohol. This lamp has been introduced into this country and is made in three sizes, changing 90 c. c., 200 c. c., 300 c. c. of alcohol to aldehyde per hour.

When I began to experiment only the Tollens, Gambier and Brochet and Trillat lamp had been described, and neither of them, so far as I could find, were for sale in this country.

It seemed to me also that neither of these could come into general use, for neither made it possible to easily generate the aldehyde in sufficiently large amount. The same objection also applies to the Krell lamp, though it is evidently an improvement upon the others.

My first attempt at a solution of the problem was to use an ordinary lamp with thin platinum, or platinized asbestos, above or surrounding the wick. I found the asbestos better than sheet platinum, but did not succeed in making in this way a satisfactory apparatus as to quantity of gas and ease of use. I later devised the following:

I take a disc of moderately thick asbestos board and have it perforated with small holes close together. This is then platinized in the usual way, using quite a strong solution of platinic chloride. If now a shallow dish, cylindrically formed, and of such size that the perforated asbestos disc will just cover its top, be partly filled with methyl alcohol, it serves as the lamp font. If the platinized disc be wet with the alcohol, seized in a pair of forceps or small tongs, removed from the dish and the alcohol lighted, it will, by the time its alcohol burns away, be heated sufficiently, so that when placed over the lamp font again it will continue hot and change the alcohol to aldehyde. Experience shows that with proper depth of dish and suitable holes for admission of air, the disc keeps of a proper redness to bring about the change most efficiently. In order to avoid all chance of the alcohol catching fire and to provide for regulation of the air supply, I have it constructed in accordance with the sample I have here with me. (Professor Robinson here exhibited his apparatus and explained its construction.)

The advantage of this apparatus is, that it is easily used and the amount of alcohol changed in a given time depends upon the size of the disc. A disc about six inches in diameter serves to change a liter per hour, and this is about as much as is ever wanted. I think also that this form of apparatus gives a larger yield of aldehyde than any other. It exposes a much larger surface of platinum to the alcohol and air than any other, and keeps it of a more uniform temperature; and I have no doubt but what this is the reason why my experiments show a less amount of alcohol needed to disinfect a room than those of Trillat. I am very sure that the blast form of lamp as devised by Krell must discharge considerable amounts of alcohol unchanged; in fact, I know it does, for I constructed such a form of apparatus after abandoning the wick lamp, and tested it to my satisfaction. Having constructed a lamp in the manner described, I next undertook a series of experiments, which in general tended to confirm the results of others. I will speak only of those which had to do with room disinfection.

I selected a room containing about 3,000 cubic feet and having three large windows with very loose sash. I found that one liter of alcohol used and the room closed for four hours was not enough to completely sterilize infected matter, if it was covered up or concealed to any great extent, but when two liters were used, or even one and a half, complete sterilization resulted in about three and one-half hours. I mean complete destruction of diphtheria and typhoid cultures, and no turbidity in any of the cultures within two days. Occasionally, after five or six days, a slight growth of the hardier molds would appear in some of the cultures, as other observers have noticed.

The remarkable penetration of the substance was shown by the fact that all parts of clothing, including seams, inside of pockets, etc., were sterilized in all parts of the room. Typhoid bacillus was destroyed even when buried half an inch deep in sand.

But perhaps the most remarkable results were obtained from bedding. Cultures of typhoid and diphtheria were placed under the clothes, under the pillows, and even within the mattress, and found killed by two liters of alcohol in seven hours. The same result was obtained when cultures were rolled up in a mattress and the whole tied into as compact a bundle as possible.

The reason of the remarkable penetrating power of the gas is undoubtedly in the fact that when hot it is of almost the same specific gravity as air, hence readily mixes with air and has no tend-

ency to separate out. But, while its specific gravity is favorable to its penetration, it is also favorable to its escape from a room; hence it is very quickly removed from a room upon opening doors and windows. It also escapes readily from all leaky places in a room. This is why results in small, close chambers or boxes are far different in amount needed from those in large rooms. The more open the room, the more must be used. It is for this reason that I am of the opinion that effective house disinfection cannot be most economically done by generating the gas in a single room and allowing it to pass through open doors and stairways. In my judgment, three quarts burned in three different parts of a house would be as effective as six burned in one place. It is, however, rather rare that a whole house needs disinfecting.(1) Commonly a single suite of rooms, not more than two in number, are infected. Two quarts of alcohol burned in one of them and the rooms kept closed for from three to four hours would, I think, be sufficient.

I do not believe that it would be at all safe to burn less than a quart in any ordinary living room. (It will be noticed that the room I used was considerably larger than an ordinary house room.) As I said at the beginning, I do not intend to weary this association with details of experiments, but have confined myself to results. In the report of the Maine State Board of Health, all details will be given for future reference. I will, however, note some of the most interesting articles which have been written on the subject, for the benefit of those who may wish to consult them.

I will add also that the bacteriological work was done by my assistant, Dr. B. L. Bryant, and that we have made experiments upon book disinfection and other uses of formaldehyde, which we hope to publish later.

Hofmann: Liebig's Annalen, Vol. 145, 1867.

Lehmann, Gegner, Blum: Munschen Medicinische Wochenschrift, No. 32, 1893.

Phillip: Muns. Med. Woch., No. 47, 1894.

Miguel: Annales de Micographie, 1894-5.

M. Trillat and others: Revue D'Hygiene, Vol. XVII, No. 3, 4, 5, 8.

Slater: London Lancet, April, 1894.

Giornale Della Reale Societa Italiana D'Igiene, 1894, No. 7.

Gambier and Brochet: Revue D'Hygiene, No. 2, 1895.

(1) Since writing the above I have disinfected a large house of 16 rooms, using 10 gallons of wood alcohol, doing the whole with three lamps in about 18 hours.

Tollens: Berichte Deutschen Chemischen Gesellschaft, 28, No. 3.

Diendonne: Arbeiten aus dem Kaiserlichen Gesundheitsamte, Vol. XI, No. 2

Domischen: Same; Vol. XI, No. 3.

LAMP FOR THE GENERATION OF FORMALDEHYDE GAS AND A METHOD OF DETERMINING THE AMOUNT OF THIS GAS IN A GIVEN SPACE.*

By E. A. De Schweinitz, Ph.D., M.D.,
Chief Biochemic Laboratory, Department of Agriculture, Washington, D. C.

In connection with experiments in trying the effect of formaldehyde gas upon the cattle tick some time ago, I had occasion to construct a lamp for the generation of this gas, which is very easy to use and may prove of service for purposes of disinfection.

The principal value lies in a wick which is so prepared that it will convert wood-alcohol into formaldehyde gas. An ordinary lamp wick is taken, either round or flat, and to the top is attached by wire a piece of sheet asbestos about one and one-half inches in length. The asbestos is impregnated with platinum and copper or with one of these alone. The wick is then placed in any ordinary lamp which it will fit. The lamp is filled with wood-alcohol and the capillary attraction of the wick draws up a sufficient quantity of alcohol, which, passing over the impregnated asbestos, is oxidized by the oxygen of the air to formaldehyde gas. A lamp with a central draft, like a Rochester burner or a student's lamp gives the best results, though lamps with flat wicks may also be used. In starting the lamp, it is lighted and allowed to burn for a minute until the asbestos begins to glow. The flame is then blown out, but the asbestos will continue to glow as long as there is any alcohol in the lamp.

In trying the effect of this gas upon cattle ticks, I found that the young ticks are easily killed by an atmosphere containing 1½ to 2 per cent. of this gas. The old ticks are but slightly affected by an atmosphere containing 5 per cent. of the gas. An interesting point, however, developed in this connection, was noted, viz., that a calf

* Read at the meeting of the American Public Health Association, Buffalo, N. Y., September 17, 1896.—From the Journal of the Association for October, 1896.

kept in an atmosphere of 5 per cent. of this gas for three hours was not greatly inconvenienced. It coughed a few times and there was a little watering from the eyes and nose, but as soon as removed to the fresh air it seemed to be entirely well and showed no bad after-effects.

To what extent this fact can be utilized in disinfecting stables and the like can be learned only by further experiment. The value of formaldehyde gas or its solutions has been very thoroughly worked out in France and Germany and by numerous experiments in this country, some of which have been presented to you already, so that it is needless for me to repeat.

The value of this gas, however, as a germicide, as an insecticide, as shown upon moths, and parasiticide, makes it useful to have a method at hand which will permit of a ready determination of the amount of gas in a given space.

Applying principles well known, with the assistance of Mr. Emery, I have developed a method which promises to be satisfactory.

The sample of air to be analyzed is measured in a gas burette and then passed into an absorption burette (Hempel) which contains a solution of alkaline permanganate of potash, or sodium hydrate solution, or ammonium hydrate. After the absorption of the gas the residual volume is again measured, from which the percentage can be easily calculated. If Am. hydrate is used for the absorption, the residual air must be washed in a sulphuric acid burette before noting the final volume.

If none of the alcohol is wasted while being converted into the aldehyde, a liter of the wood-alcohol will give 5 per cent. aldehyde in a room 10 x 10 x 10. The Sp. Gr. of formaldehyde gas is 1.6 air = 1.

One c.c. of the gas weighs .00207 grams and 1 liter pure wood-alcohol converted into the aldehyde gives 748 grams aldehyde = 36,100 c. c. gas.

From these data it is easy to calculate the amount of pure alcohol that must be used in order to obtain a definite volume and percentage of the gas. The lamp described will burn in a confined space until nearly all of the oxygen in the air is exhausted.

The fact that this gas and its solutions are practically without injurious effect upon metal, wood and cloth, and most colors, and the minute amount necessary to secure the destruction of bacteria, makes formaldehyde practically the best gas yet known for disinfecting purposes.

REPORT OF CHAIRMAN OF COMMITTEE ON POLLUTION OF WATER SUPPLIES.[1]

By CHARLES SMART, M.D.,
Major and Surgeon U. S. A., Washington, D. C.

It is my duty this morning to report on behalf of the Committee on the Pollution of Water Supplies. At our meeting in Montreal I was appointed chairman of this committee with authority to select associates; but, although two years have elapsed since that time, the organization of the committee remains unfinished. This has not been on account of want of interest or want of effort, but on account of difficulties encountered in the work of forming such a committee as was desired by the association.

For many years prior to the Montreal meeting I had been a member of the Water Committee, and during all that time I looked at questions of purity and impurity of water supplies from the standpoint of sanitary chemistry. Bacteriology, however, was coming to the front, and a careful survey of the field was necessary to determine whether the methods of the sanitary analysts should not be altered and their test tubes turned into culture tubes for the bacterial flora. I discussed this subject before you at our meeting in Milwaukee, and reached the conclusion that the bacteriologists at that time were as yet unable to deal single-handed with sanitary questions concerning water supplies. Nevertheless, the progress of bacteriological research was so rapid and the hope of practical sanitary results so great, that when the suggestion was made to me by our associates, Adami and Wyatt Johnston, of a co-operative bacteriological investigation, I accepted it promptly and embodied it in the report which I submitted at Montreal.

The association approved of the proposition, and since then I have been endeavoring to carry it into effect. It was intended that the committee, when fully organized, should consist of all the bacteriologists who had laboratory facilities at command and were willing to engage in this systematic investigation into the wholesomeness of water supplies. Several earnest and able workers were present at the Montreal meeting: J. George Adami, of McGill University; Wyatt Johnston, of the Provincial Board of

[1] American Public Health Association. Presented at the Buffalo meeting of the Association, Sept. 15-18, 1896—From *The Journal.*

Health of Quebec; J. J. McKenzie, of the Provincial Board of Ontario; George W. Fuller, of the Lawrence (Mass.) Experiment Station; Gardiner T. Swartz, of Rhode Island, and F. Ferguson, of the New York Hospital. All of these men recognized the great value of the proposed investigation. They knew that it would give an immense impetus to bacteriological work; that it would do much to clear away the confusion surrounding species and to systematize and increase our knowledge, and that practical results might also be expected, particularly as regards the typhoid and colon bacilli, with a flood of light upon the wholesomeness of water supplies and a reduction in the death rate from enteric fever and diarrhoeal diseases. They held several meetings and considered the details of the subject. They communicated with the various laboratories and found that the bacteriologists of the country were not only willing to participate in the investigation, but anxious for the inception of the undertaking. Had no obstacle of a technical character been encountered the co-operative investigation would have been in full progress in all the notable laboratories of North America within three months of the meeting at Montreal. Certain bacteriologists of large experience and more than national repute, whose current duties prevented them from participating in laboratory work, heartily agreed to act in the capacity of an advisory council to the committee in developing its work, and particularly in the consideration and settlement of difficult questions. This council consisted of five members: Surgeon-General George M. Sternburg, or the army; Professor William H. Welch, of Johns Hopkins University; Professor Victor C. Vaughan, of Ann Arbor, Mich.; Professor T. Mitchell Prudden, of the University of New York, and Professor Theobald Smith, then of the Agricultural Department, Washington, D. C.

Meanwhile, as it was evident that a work of this kind could not be carried on without a supply of funds in excess of that appropriated by the Executive Committee of this association, an effort was made to find out how far some of our great insurance companies would sympathize practically in the undertaking. The association had by resolution commended the proposed work to the favorable notice of State and local boards of health and all persons interested. Certain boards, by their Secretaries, had stated their willingness to help financially when called upon, inasmuch as they recognized that money would be needed for printing, postage, expressage of cultures between laboratories, importation of cultures from Eu-

rope, and probably for the expenses of a convention of the leading men to settle uncertain points when everything that could be done by correspondence had been accomplished. It had been suggested by one member of the association that the great insurance companies would subscribe liberally to any investigation which promised to lessen mortality and was sustained by the general sanitary voice of the country as expressed in the resolutions of the American Public Health Association. To verify this, I had interviews with Vice-President Alexander and the medical director of the Equitable Life and with the medical officers of the Mutual Life of New York. I desired to know how the committee would probably be treated by the companies in case funds were required to carry on the work. The general tenor of the replies was not favorable, but in discussing the subject, it was readily conceded that if one of the big companies would subscribe, the others would speedily fall into line. However, no formal application was made to the companies nor to any one else. The intention was to make such an application only when the committee was ready to go on with its laboratory work.

But the committee is not even now prepared to go on with its laboratory work. It met with a set-back at the outset. It discovered that the laboratory methods varied so much that nothing could be accomplished by collaboration until standard methods were devised and adopted. To settle all unsettled points and decide upon these methods, a convention of bacteriologists was called and met in New York city in June of last year. The papers read at the convention and the report of the proceedings are given in full in the October issue of our *Journal*. From it you may learn that the convention, notwithstanding the earnestness of its members, failed to accomplish the work of formulating the standard laboratory methods. Many of the points at issue were so delicate that they could not be weighed on presentation and brought to an immediate vote. The convention therefore, turned over its responsibilities to a committee and agreed to accept the report and methods of the committee as its own, to be promulgated among the bacteriologists and referred to the Water Committee of the American Public Health Association, which had called the convention into being. This committee of the bacteriological convention consisted of Professor Adami, of McGill University; Professor Abbott, of the University of Pennsylvania; George W. Fuller, of the Louisville Water Company; Dr. Cheesman, of New York; Professor Sedgwich, of the Massachusetts Institute of Technology; Professor Smith, of the Bussey Institute, Massachusetts; Professor Welch, of Johns

Hopkins, Baltimore, and myself; and I here present to the association its report:

"Recommendations of a committee of American bacteriologists appointed by the convention of bacteriologists (called together in York in June, 1895, under the auspices of the American Public Health Association) to draw up a scheme of tests to be employed in the study and description of species of bacteria."

This report was drafted by Professor Adami from the materials supplied by the convention and other special memoranda brought forward at a meeting of the committee in New York in February last, and was then submitted in turn to each of the members for criticism and amendment. It is as yet unfinished, as it has to pass through the hands of Dr. Cheesman and Professor Welch. This work, to the perfection of which so many minds and so much bacteriological experience have contributed, must be regarded as manuscript which will mark a period in the history of bacteriology. Your committee feels proud in presenting it and confident that it will reflect credit on American bacteriologists and on this association, which provided the official facilities for its development and maturation.

When the standard methods of the convention are in the hands of the bacteriologists of this country and time has been afforded them for consideration, the Water Committee of this association will then be in condition to define its lines of action for effecting an organization for co-operative work, as suggested at Montreal. Your committee has had much experience since then, much experience of the difficulties that lie in the way of effecting such an organization. On this side of the Atlantic the bacteriologists who have the necessary experience are in positions where executive duties take up much of their time, and the younger men are employed for a specific line of work other than on water supplies. The delay of two years in determining methods has given the bacteriologists time to realize the amount of work involved in a co-operative investigation, and has probably permitted the enthusiasm of many towards the proposed work to subside as other subjects attracted attention. This will increase the difficulty of effecting an organization; but the earnest volunteer work done by our bacteriologists as shown in the proceedings of the convention and in this report of its committee, emboldens your Committee on the Pollution of Water Supplies to believe that it may be able hereafter to go further in connection with the bacterial flora of water supplies than the mere development of the standard laboratory methods by which that flora is to be studied.—From the Journal Association for October, 1896.

THE DANGER OF CONTAGION IN STREET CARS.*

By E. B. BORLAND, M D., of Pittsburg, Pa.

That the world is better, cleaner and more healthful than it was even a score of years ago is evident to any interested observer. That this progress is largely due to improved sanitation cannot be questioned. Improvements, however, have been made only along certain lines, while other sanitary matters of equal, if not greater, importance have been neglected. In this city choleraic diarrhoea have been reduced nearly one-half in the last five years, and this reduction may be directly attributed to smoother, cleaner streets and to purer food supplies.

On the other hand, we still carry with us the municipal disgrace of a typhoid fever mortality more than four times greater than New York, Brooklyn, or even London. In Pittsburg, in 1894, 1,197 cases, with 152 deaths; in 1895, 1,593 cases, with 213 deaths. Is this progress?

Another of the disease-breeding and carrying centers which has received little or no atention, is the modern street car. No public conveyance is so frequently used by all classes. It ought to be a model of sanitary perfection, but, alas, it is not. It is probably the greatest single contagion carrier in metropolitan life. Cars with seating capacity for only thirty persons, with less than 200 square feet of floor space, are frequently crowded during busy hours with from sixty to ninety or more passengers. With all the windows thrown open, it is impossible for every passenger to obtain sufficient fresh air in a crowded winter car.

Where does the unfortunate mortal get sufficient oxygen to sustain life in a crowded, closed winter-car during the average twenty-minute ride? The adult individual needs 1,000 cubic feet of fresh air every twenty minutes to supply sufficient oxygen to his system to keep his respiratory organs in normal condition. Does he get 500? It is doubtful if he gets 100 in the average crowded car.

Then each passenger who occupies a seat has the extreme pleasure (?) of knowing that his standing neighbor is spraying his face with an invisible (frosty mornings excepted) mist, always laden with animal matter—and often with disease—twenty times a minute. Each passenger has a satisfaction (?) also of taking a

*Paper read at meeting of Allegheny County Sanitary Commission, Pittsburg, Nov. 7th, 1896.

bath in about two liquid quarts (vaporized) of poisonous skin excretions, thrown off by sixty persons in a twenty-minute ride. To cap the climax, each passenger (always a man) who is so inclined, either through ignorance, uncleanliness, or viciousness, deposits his surplus saliva or expectoration on the floor, where it dries and is disseminated readily into the air by the movements of the car, and thus disease is carried to all susceptible individuals. Women do not spit on the floors, but they wear skirts long enough to wipe up sputum and carry it with them into their homes.

SCOURGES OF THE CITY.

The five scourges of this city, according to reports of the bureau of health, are pneumonia, tuberculosis, diphtheria, scarlatina, and typhoid fever. The first two in this list were the causes of nearly 1,000 deaths in Pittsburg last year. The primary cause of pneumonia is largely impure air, which first vitiates the delicate lung tissue. Upon leaving the car the person is attacked by a chill. If he survives the attack he may be left with a damaged lung, which is likely to become infected with the scourge of the human race, tuberculosis. That scarlatina, diphtheria and tuberculosis are markedly contagious and infectious cannot now be questioned. Tuberculosis is the most important disease of the above list, because it causes 14 per cent. of all deaths, and this is the highest death rate of any single disease. Its prevention gets little attention, and "it goes marching on." Less than five per cent. are born with it; more than 95 per cent. become infected after birth. Any weakling, either lean or fat, no difference how robust his parents, may suffer if he breathes a tuberculosis atmosphere.

The most important source of infection is, undoubtedly, expectoration from ulcerating pulmonary lesions. The fresher the sputum the more virulent the bacilli. In an ounce of it, millions of the special germ (tubercle bacilli) can usually be found with the microscope. These germs withstand freezing, and live for months when not exposed to sunshine and fresh air. Probably not less than eight persons in every thousand are daily expectorating tubercle bacilli. These germs can be promptly destroyed by boiling water (15 minutes), corrosive sublimate, 16 grains, and one dram of tartaric acid dissolved in one pint of water, or a 10 per cent. solution of carbolic acid. Either of these solutions can be used in well-glazed cuspidors.

It is known by medical men that it is not necessary for any child to have an attack of even whooping cough, measles or mumps in

order to make him grow. He grows faster, is healthier and happier, and lives longer without having any infectious diseases, and, further, it is his birthright that he be protected to the fullest extent possible. The crowding of and expectorating in street cars have much to do with the spreading of all the above-mentioned infectious and contagious diseases with the exception of typhoid fever, which is a water-borne disease.

The preventive measures are, open summer cars during summer only. The heating of winter cars by electricity, if possible, to economize oxygen. Uniform ventilation. Sufficient number of cars at all hours to seat each passenger. Placing cuspidors (partly filled with sawdust, moistened with a 1 to 250 corrosive sublimate solution) in a wire rack a few inches from the floor, in each end of cars; cuspidors to be cleaned each day when car is cleaned. Placards positively forbidding spitting on the floor, and the unceremonious ejection from the car of any passenger who refuses to obey. A similar rule is successfully enforced against smoking, why not against the more filthy and dangerous habit of spitting on the floor? A man always looks guilty (as he knows he is) when seen spitting on the floor.

What has been said about spitting on the floors of street cars and the care of the sputum applies to railway cars and all public buildings, with the exception of churches. Church-going people get along without expectorating on the floors of their places of worship, and this is evidence that respectable people can avoid it in public buildings, conveyances and sidewalks.

NEED LEGISLATIVE ENACTMENT.

As a result of the growing popularity of the highlands of southern New York and northern Pennsylvania as resorts for consumptives, the town of Liberty, in Sullivan County, N. Y., has just passed an ordinance, according to the New York Herald, forbidding, under penalty, all persons from expectorating upon the sidewalks, dooryards, or floors of houses. The health board does not wish the little town to become a center of infection. Such an ordinance should be passed and enforced in cities as well as towns. Four hundred years ago Galileo declared "The world moves." It still moves, and the sanitary world must move with it. Until the golden dawn there will always be a few persons who oppose every useful reform, and wail over every rotten institution as it fails. On the other hand, there are thousands of intelligent, sensible, respectable citizens who are now ready to put their shoulders to the

wheel of preventive medicine. It must roll on until every preventable disease is reduced to the lowest possible limit or eradicated, and this disease-cursed world is made what its Creator intended to be a modern Eden.

DISCUSSION.

Dr. Frank Lemoyne, president, congratulated the author of this paper upon having presented an important subject in a concise and impressive manner. He said the general belief of acknowledged authorities, that tuberculosis is infectious and that it and the other diseases of the same class are disseminated by atmospheric and alimentary germs, should influence all thoughful people to exercise and demand every reasonable precaution against their destructive influence.

Bishop Cortlandt Whitehead, after heartily indorsing the sentiments enunciated by the reader of the paper, spoke briefly as follows:

"There is certainly abundant room for improved sanitation in our street cars, and one important particular is in regard to ventilation. Cars are often crowded to suffocation, with none of the ventilators open. If a passenger takes the liberty of opening a transom he runs the risk of a reprimand from the conductor; and we all know how useless it is, at times, to ask the supreme autocrat who rules the car to make a change for the better. The overcrowding of cars is a great evil, and should receive immediate attention. This matter is regulated in European cities, why not in Pittsburg? Now, in Paris (and the same is true in London) if no one is allowed to enter a public vehicle when it is carrying the prescribed number of passengers, and that law is so rigid that no one dares to infringe it, why cannot a similar law be enacted in Pittsburg? We are supposed to govern ourselves in this country; why cannot we govern according to a higher standard?"

Rev. A. H. Lucas among other things said: "I do not think there has been any organized effort heretofore to remedy these evils. So far as the signs forbidding spitting on the floor are concerned, I think that was accomplished by the efforts of Christian women, who agreed to furnish the signs if the company would put them up. This has been done, but I do not think the order is enforced. I have never seen a conductor attempt to enforce it. I think the best way to secure the desired results is to get the general public to rise in just indignation."

PRACTICAL SANITATION IN GLASGOW.*

By PETER FYFE, F. R. S E., Chief Sanitary Inspector.

I have taken a little trouble to go into the commercial aspects of overcrowding, with the object of showing that the present administration of the law enables the overcrowder to make such a profit out of his continuance in ill-doing that an occasional fine of 2s. 6d. or 5s., so far from being a strong deterrent, simply takes a small percentage from his gross drawings during a year.

Perhaps a few actual examples taken from the various Night Inspectors' records will exhibit this phase of the overcrowding problem better than a general statement. They are but samples of hundreds of others.

The first case is that of a woman who rents a one-apartment house at 233 High street. It contains 1,026 cubic feet of free space, and the rent she pays to the proprietor is 7s. per month. The number of persons who may reside in it was marked on the ticket as 2½ adults. She supplied this room with a few simple articles of furniture, and sublet it to two men and two women at 5s. per week for each couple. This number were found sleeping in it by the Inspectors, and she, being the real occupier, was brought before the court and fined for her offense in 2s. 6d. As she was making 40s. per month out of her lodgers and only paying the proprietor 7s., she could well afford to pay three or four times the penalty imposed. Such persons find it worth their while to run the risk of being discovered upon several occasions by the Night Inspectors, whose complete rounds occupy a few months.

A different kind of case is exemplified by the following: A man living in Stirling road was found, with his wife and eight of a family in a small two-apartment house of 1,600 cubic feet of space. This house is ticketed for four, and *ten* persons were discovered sleeping in it—five of these being under ten years of age. When brought into court he was convicted and admonished. Usually such bad cases are fined in 2s. 6d. The rent of this house was 10s. 6d. per month, or at the rate of a fraction over 1s. per month per person. A house fit to accommodate such a number legally would cost about 16s. per month, so that, even if such a man is fined 2s. 6d. or even 5s. every *three months* in court, he would find it financially advantageous to run the gauntlet of the police courts, as these people

* Abstract of Report of Sanitary Department for 1895.

get to be aware that it takes, upon an average, three months before the Inspectors come round again.

I cite another example to exhibit overcrowding in its most dangerous aspect: Since 1893, a small house, of 700 cubic feet, in 21 Duke street, has given us much trouble and concern. This, and other small houses in this locality, are let to a woman who makes a practice of subletting them at the exorbitant rent of 4s. per week, she herself paying the factors 4s. 6d. per month. In the small apartment in question the sub-tenant was found with five adults and one child sleeping therein on the 11th of October, 1895. She was convicted and fined in 2s. 6d., but, unfortunately, the city had to pay a much higher penalty, inasmuch as shortly afterwards her son was stricken with *typhus*, and had to be removed to Belvidere, while she had to be boarded at the city's expense in the Southside Reception House for seventeen days.

It need hardly be stated that these cases could be multiplied to a very great extent, but I believe enough has been put down to show that, while undoubted cases of real poverty and distress continually come before the courts, there is much needless, wilful and persistent evading of the law. With such a baleful disease as *typhus* following closely on the wake of overcrowding, and considering the fact that a large proportion of the ticketed houses are more or less continually in a state of being overcrowded, some more stringent measures are required before much headway can be made against this class of social iniquity.

As Inspector of common lodging-houses, I have to report that, during the year three houses have been added to the register, giving an increase of accommodation for 603 lodgers. The total number of beds in such houses is now 9,372. Good order has prevailed during the year, only one prosecution being necessary, against an occupier, who has since closed the house.

In forty-one cases the Inspector reports the ventilation as "bad," meaning that the atmosphere at 8:30 a. m. was very close and offensive. There is no mechanical ventilation in any of the dormitories, and the keepers refrain from opening the windows until all the lodgers are out of bed. The act of parliament does not, so far as I can judge, give the local authority any power to prescribe an hour for the general awakening of such lodgers, and compulsory removal of the sleepers from their bunks; and as I find a general desire on the part of keepers to grant a little license in this direction, I have refrained from pushing the regulation. Moreover, I

find that in Edinburgh, Aberdeen, Paisley and Perth the hour fixed for commencing the ventilating process by opening the windows is 10 a. m.

INSPECTION OF VESSELS.—With regard to seamen's and emigrants' boarding-houses and ships in the harbor, I have to report an increase of 1,704 foreign emigrants over the number in 1894, viz.: 6,103, in place of 4,399. Last year the various restrictions imposed by the American representative had much to do with stopping the flow of foreign emigration. Since his withdrawal by the United States government it has increased, although the baggage of these people still undergoes the process of disinfection at the stations of the shipping companies. I am pleased to be able to report that no serious disease was detected among the emigrants.

In all fifty-one inspections were made of vessels in the harbor. In several of the older steamers it was found that the sanitary conveniences consist of pail closets. These are hosed out with water every morning. All modern vessels are fitted with water closets of the most approved construction, and adequately flushed.

Two cases of *smallpox* were discovered on board two steamers. The infected men were coolies. These cases, and one of *enteric fever*, were removed to Belvidere Hospital and the steamers disinfected. On the compartment occupied by the two infected coolies being measured, it was found that each man had to occupy a space containing only 74 cubic feet. In one of the Glasgow vessels alterations were made at the instance of the sanitary officer, which resulted in improving the ventilation.

The measurement of the sleeping quarters of the sailors and firemen discovered the average space given to sailors to be 190 cubic feet and to the firemen 167 cubic feet. In some ships these figures were 335 and 361 respectively. The lowest found was 63 cubic feet per fireman.

Under the Factory and Workshop Acts 503 workshops have been placed on the register, sketched, measured and reported upon. The Factory and Workshop (amendment) Act came into force this year. It places all local authorities under the necessity of attending to complaints sent in by H. M. Factory Inspectors "within one month," and also directs that within that period the local authority shall report to H. M. Inspectors what "proceedings" have been taken by them consequent upon the complaint. A hopeless confusion is likely to spring up from such an order, unless the various officials arrange in a friendly way some *modus vivendi*. This will be comprehended when it is understood that no powers are given to local authorities to act in terms of any of the sanitary pro-

visions of the Factory and Workshop Acts— their only powers in such cases being those contained in thePublic Health Acts, with which factory inspectors have necessarily but a passing acquaintance. Hence, many complaints urged by the factory inspectors, while probably quite legitimate under the Factory and Workshop Acts, are not legitimate under the Public Health Acts. Consequently many complaints under the one set of acts are not notifiable under the other set, and the local authority's reports on these as to their subsequent proceedings amount to stating that "nothing has been done." All local authorities should be empowered to exercise fully the sanitary powers specified in the Factory and Workshop Acts, and it would be highly advantageous to withdraw the menace implied directly in the amending act of 1895 as to the compulsory action which factory inspectors may exercise against local authorities presumed by them to be in default. Any such action could only lead to friction, and would not advance, but rather retard, sanitary activity throughout the country.

In connection with this part of the work of the sanitary department, I have to report that all the restaurant and eating-house kitchens were carefully inspected during the year. In all 422 of these establishments were visited and inspected. A large number of details were collected and recorded as to their sanitary condition, and good work has been accomplished by the meat inspectors in securing limewashing, general cleanliness and good order in almost all kitchens where meat is cooked. The ventilation, particularly if underground or cellar kitchens, has in several cases been improved, although it must be admitted much in this direction requires to be done, and could be done if your officers had more definite legal powers. Dairies and ice-cream shops have to be registered in the special books of the corporation and come under special sanitary regulations, and it appears to me expedient that all restaurant kitchens, and particularly cellar kitchens, should likewise be subject to special sanitary rules.

Under instructions, the inspectors took observations of the summer and winter temperatures in each kitchen. These were taken betwen the hours of 11 a. m. and 3 p. m. From these reports I find that in summer four registered a temperature between 90° and 100° Fahr.; 84 a temperature between 80° and 90°, and 280 a temperature between 70° and 80°. In the winter season one registered between 80° and 90°, and 15 showed a temperature between 70° and 80°. The thermometer in each case was hung in the centre of the kitchen.

These figures indicate pretty strongly that, at any rate during the warm weather, an installation of mechanical ventilation in several kitchens would be of special benefit to the female workers in low-roofed underground kitchens, where the air can only be characterized as "hot and stifling." Meantime the Factory and Workshop Acts empower a demand for such only in the case of a factory possessed of motor power of some description, and such demand can only be legally made by the Factory Inspector.

Four thousand and twenty-eight primary inspections were made under the Shop Hours Acts by the special officer. As against 453 cases of contravention last year, I have to report for this year that only in 35 cases were young persons under eighteen years of age found working an excessive number of hours per week. The offenders were all warned, and upon a re-inspection they were found complying with the act.

Ten thousand one hundred and eighty-two re-inspections were made among those formerly visited. Out of this number 55 were discovered contravening the provisions of the act with respect to the overworking of young persons; 7 of these were entered for prosecution, 4 were convicted and fined, 1 was found "not proven," and 2 cases were withdrawn. These 55 were again visited, and found complying.

Thirty-two persons were prosecuted for failing, after due notice, to hang up the notice card prescribed by the act, and fines (including expenses) amounting to £20 1s. 5d. were imposed by the Sheriff.

Two hundred and fifty-one cards of instruction as to the terms of the act were delivered to new shopkeepers and 448 were given to messengers who called at the office for them. I can now report that this act is now almost universally obeyed in Glasgow.

Two hundred and ninety-six samples were taken under the Sale of Food and Drugs Act and the Margarine Act, as against 246 in 1894; 32 samples were found to be adulterated.

During October eight samples of sausages were obtained for analysis by Dr. Clark. Six of these were obtained from well-known makers in order to ascertain what proportions of bread and water each was introducing into this savory article of diet.

It is evident from them that the public can be deceived to any extent as to the proportion of nutrient animal matter they possess in their pound of pork sausages. I need hardly say the Food and Drugs Acts do not provide any protection to the public in the pur-

chase of sausages adulterated with bread or water to any excessive extent. If nothing poisonous be introduced, the law can no more be put in force here than in the case of mixing sweetmeats of a specific name with paraffin wax.

As a protection against cholera 10,188 wet ash-pits and privies were limewashed by the department and 151 sunk passages and wastages were cleansed of filth and similarly treated. The total cost was £160 12s. 5d., or 3 7-10d. each. A new and improved method of disinfecting these offensive spots is being devised.

Eight hundred and eighty-nine persons were removed from infected dwellings and boarded for a quarantine period in the reception houses of the corporation.

Four hundred and seventy-six unclaimed dead were interred under the Public Health Act at a total cost of £376 17s. 6d., of which the sum of £67 1s. 2d. was recovered.

The washing and disinfecting staff dealt with 586,366 articles of bedding and clothing taken from infected dwellings. Out of this number the wash house at London road is responsible for 327,603 and that at Possilpark for 258,763.

The death rate of Glasgow from all causes for the year 1895 was the same as it was for 1893, viz., 23.09 per 1,000, as against 23.3 in the latter year; being 20 per 1,000 for 1894, a rise of 3 per 1,000, which, in a city of 692,584 inhabitants, means an increase of 2,077 in the death list. This unsatisfactory increase was not found to be due to the incidence of infectious diseases, as the total cases recorded in 1895 over those recorded in 1894 was only 126. The Vital Statistics of the medical officer, when they come to be published, will most likely point to the cause as being almost entirely climatic, as, during the early months of this year we experienced an abnormally low temperature for a prolonged period.

HYGIENE OF CANADIAN RAILWAYS.

The Ontario Board of Health, with a view of ascertaining the actual status of hygiene on the Canadian railways traversing that Province, sent a series of questions to the two large trunk lines, as well as to the Wagner and Pullman Companies running cars over those lines. The answers received were in many respects satisfactory, and should convince the public that the interests of health are not only not neglected, but safe-guarded. The first question dealt with the ventilation of the carriages, and the replies showed

that all the companies used natural ventilation, fresh air entering the open door or windows of the carriage and escaping principally through the clear-story windows in the roof. The lavatories and closets were provided with specially designed ventilators. The replies regarding the cleansing of the cars were most satisfactory. The cars, as a rule, were washed out daily, or on long runs, swept out and dusted daily, and washed at the end of the run. Special attention was paid to the closets and urinals. After reading the replies given to this question one is obliged to draw inferences laudatory of the cleanliness of the carriages as compared with the closets and urinals of schools, court house and other public buildings.

The cars were, about once a year, thoroughly renovated and painted and upholstered, if necessary. The stuffy smell noticeable in first-class day cars and sleeping cars is partly due to the woollen and stuffed seats and backs, which in spite of frequent removal and beating still retain the animal odors emanating from the clothing and persons of their occupants. This will continue so long as the public will prefer green or red plush to leather upholstered seats and backs, even with a wire spring seat beneath. The question, "What action do you take if an invalid occupies a berth?" was intended to elicit the method adopted in cleaning a sleeping-car berth which had been occupied by a tuberculosis patient, and it was found that such patients could occupy berths without hindrance. Patients with the other infectious diseases were not allowed to travel by day coach or sleeping car, but if such should occur, the cleansing and disinfection of the car followed as a matter of routine.

The question relative to heating showed that steam from the locomotive was now used, though the system of hot-water heating still prevailed. The methods of lighting were unsatisfactory, for with a very few exceptions where the Pintsch gas was used, oil was the luminant employed. To the last, though by no means the least, important question asked, the replies showed that all precautions were taken to secure a supply of pure ice and pure drinking water.

Several valuable suggestions are offered in this report as to certain improvements that should be made, and if these are carried out travellers in Canada will enjoy better hygiene in railway carriages than in many public or even private buildings.—Montreal Medical Journal, August, 1896.

THE INFLUENCE OF CLIMATE ON GENITO-URINARY TUBERCULOSIS.[1]

By JOHN C. MUNRO, M D , of Boston.

In the cities and large towns along the Atlantic seaboard tuberculosis of the kidneys, bladder, prostate, vesiculae, epidymes, or tubes is far from rare; it is frequently overlooked, especially in the earlier stages, and often, when recognized, the disease has created so much havoc that nothing can be done beyond making the victim comfortable. The pathetic, relentless suffering in the later stages in such cases warrants the plea that physicians should endeavor to detect the invasion as early as possible, and that no rational treatment promising relief should be neglected.

For a long time it has been recognized that the class of patients under consideration is best treated by a careful out-door country life in conjunction with surgical interference when necessary or possible. If this is true, and there can be no doubt of the fact, cannot more be gained by sending such cases, at least in the incipient stages, to a climate where other forms of tuberculosis are benefited or cured?

In order to answer this question, a circular was sent to the members of this association requesting their views and experiences, and the writer takes this opportunity to express his gratitude for the many replies sent him, so full of kindly interest.

Of seventy-five responses, about fifty are more or less replete with valuable data, but as it is impossible to give credit to each shade of difference and interpretation, it has seemed best to condense the data and treat them as if they were the result of a single physician's large and varied experience. Reports of a number of interesting cases in support of one view or another have been sent, but it is not practicable to incorporate them in a brief summary.

The views of the majority on any one question are, perhaps, given undue prominence; the attempt, however, is made to give equal consideration to the opinions of the minority, no matter how small it may be.

[1] Read at the annual meeting of the American Climatological Association, at Lakewood, N. J., May 12, 1896.—*The Transactions*, 1896

Of the reply to the first question—"Are patients with tuberculosis of the kidney, bladder, epidymis, prostate or vesiculae benefited or injured by climatic treatment"—there is scarcely any doubt. There is no reason why the situation of the disease should form an exception to the rule, especially if the general resistance and the nutrition are improved. The benefit is, of course, indirect for the most part, but it can be materially aided by proper local treatment, not necessarily operative in the majority of cases.

The rate of improvement is not so rapid as it is in pulmonary phthisis, and it may be that, for reasons unjustly ascribed to the climate, cases occur in which harm follows this method of treatment. But in the East patients are much improved if not often cured by an out-door life, and it is not difficult to understand that the benefit might be increased by emigrating to that part of the country where the opportunities for, and the benefit from, an out-door life are naturally greater.

One or two correspondents write that they have never seen any good follow climatic treatment in the class of cases under consideration, but their experience differs so much from that of the other members that one is constrained to believe that they have, unfortunately, seen only the late forms of the disease, where any treatment is hardly more than palliative. It is to avoid sending this very class of cases that the good results from a healthy climate in the incipient stages should be emphasized. A few writers contend that joint tuberculosis do well without regard to climatic influences; but it must be borne in mind that the genito-urinary form is less localized, more easily disseminated, and canot be placed in the same category as the former. Furthermore, there is good reason to believe that joint cases are better treated in a high dry climate.

"Do patients undergoing climatic treatment for pulmonary tuberculosis develop, commonly, a genito-urinary tuberculosis when the pulmonary lesions are disappearing?"—That is, do physicians in healthy climates see genito-urinary tuberculosis as frequently as we do in unhealthy (tuberculosis) climates when patients exhibit practically no other manifestations of an active invasion of the tubercle bacilli? Apparently such a development is very rare. Four correspondents report having seen single cases only during many years of practice, while primary genito-urinary tuberculosis is comparatively unknown, a condition far different from that which obtains in tuberculosis regions.

"Does pulmonary tuberculosis tend to develop in patients undergoing climatic treatment for genito-urinary tuberculosis?" So few patients, proportionately, are sent for treatment of genito-urinary tuberculosis alone that a definite answer cannot be given, but there seems to be no noticeable tendency to invasion of the lungs in the early stages, and in all probability if such a tendency did exist, it would be retarded or prevented in a suitable climate.

In advanced cases, on the other hand, pulmonary invasion is as common in one climate as another, but how far such a complication may be retarded cannot be answered without further investigater-relation between the disease in the lungs and in the uro-genital tract.

"After apparent cure from genito-urinary tuberculosis can patients ever return to their homes?" Probably to a small extent in selected cases, when the cure has lasted for many months, where the home surroundings will be of the best, and provided the patient is persistently and carefully watched. The permanency of the cure, though less frequent, is apparently as well established as in pulmonary phthisis; it is not uncommon, however, to see instances of permanent arrest without permanent cure.

The return home should be regarded in the light of a dangerous experiment, and the change should invariably be advised by the physician in immediate charge.

Where the arrested lesions can be entirely removed by surgical interference, the chances of a safe return to the former home are much increased.

"Do patients with advanced genito-urinary tuberculosis—*e. g.*, abscess of the kidney, testes, vesiculae, etc., ever recover their general health?" Occasionally with the aid of surgery, advanced (abscess) cases do recover, but it is doubtful if the proportion is much greater in the healthy than in the unhealthy climate. After surgical interference in an unhealthy climate, the chances of a return or of an invasion elsewhere would be lessened by emigration to an anti-tuberculous part of the country.

"Must the same precautions as regards exercise, diet, rest, etc., that are given to phthisical patients be given to patients with genito-urinary tuberculosis when emigrating to high altitudes?" Practically the same precautions should be exercised in directing the daily life of such a patient as in the case of pulmonary tuberculosis, especial attention being given to the diet where there are renal or vesical lesions, and to proper exercise where the prostate or vesiculae are involved.

Over-exercise will produce general systemic or cardiac disturbance in the same way that it does in phthisical patients, and the risk of general infection cannot be disregarded in the one form more than in the other.

These patients are less amenable to treatment than are those with pulmonary trouble, and this fact must be considered when directing their habits of life.

" Is there any one type of climate especially adapted to the treatment of genito-urinary tuberculosis?" There is no one climate or locality suitable for all cases, the general rule being that where pulmonary cases do well it is safe to send genito-urinary cases.

When, however, the disease is limited to the kidneys or bladder, a climate equable, warm, and not too dry should be selected; where out-door life is most possible, and where the drinking water is of the best. Such conditions do not exclude sea-shore resorts, like Atlantic City, Nassau, the Bermudas, Jacksonville, etc. In case the immediate coast is not desirable, proper conditions can be found in regions like San Antonio, Augusta, Thomasville, Aiken, Southern California, etc.

A high, cold, dry climate is unsuitable, particularly in renal cases, if a concomitant pulmonary lesion is the point of therapeutic attack, because the vigorous out-door treatment in zero weather puts too much strain on the kidneys, and the latter organs are in a state of constant irritation, even though there is steady improvement in the chest. Even without an attendant focus in the lungs such a climate should be chosen with great caution, and with a full realization of the risk of overworking the kidneys during the colder months of the year.

Patients with the lesion limited to the epididymis or to the vesiculae can generally be treated best in a high, dry climate like Colorado, provided, of course, there is no cardiac contra-indication.

Prostatic and bladder types do well in either a low or a high altitude, care again being taken against exposure in the cold months. These cases are also benefited by treatment at the various baths, like the Hot Springs of Virginia or Arkansas, or the Hudson Hot Springs. A hot, dry desicating climate that naturally induces the various hepatic and pelvic congestions is unsuitable; there the acute venereal diseases are stubborn to treatment, and for the same reason tuberculous lesions would do badly.

In conclusion, we may say that genito-urinary tuberculosis is benefited by climatic treatment.

That patients should be sent to healthy climates in the incipient stages more frequently than has been the custom heretofore.

That this form is less amenable to treatment than pulmonary phthisis in the latter stages, but that the results of surgical interference can be improved by climate.

That moderately dry, equable, mild climates are suitable to the majority of patients, the high, colder climates being reserved for selected cases.

That whatever climate is chosen, the benefits depend upon proper food, hygiene, exercise and fresh air, as in pulmonary phthisis.

THE NEW YORK LUNACY COMMISSION.

THE CHANGE IN THE PRESIDENCY.

[From the Mail and Express, New York, October 3, 1896.]

The retirement of Dr. Carlos F. MacDonald on September 30th from the presidency of the State Commission in Lunacy, an office which he has held since the creation of the commission in 1889, marks an important era in one of the most important and extensive departments of the State government. Dr. MacDonald was impelled to take this step by a due consideration of his private interests, which have been seriously impaired by his attention to public duties. He has succeeded the late Dr. Choate as physician in charge of a high-class sanitarium for the treatment of select cases of mental disease at Pleasantville, Westchester county, and will personally conduct it, retaining an office in New York city for consultations. In his letter of resignation to the Governor, Dr. MacDonald says:

"In taking this step I deem it due to myself to make the following brief statement in explanation thereof: The complete fulfilment of the object—State care for the dependent insane—which induced me to relinquish a less responsible and more lucrative public office to accept, at the invitation of Governor Hill, the presidency of the State Commission in Lunacy on the creation of that body in 1889, has relieved me from the moral obligation which I then assumed and which was renewed when, in 1895, you re-appointed me for another term of six years. In other words, the accomplishment within the present year of this great reform in behalf of the depend-

ent insane, for the consummation of which all true friends of that unfortunate class are deeply indebted to you, has left me free to avail myself of the opportunity which has come to me to retire from the cares and responsibilities of public service, to which twenty-seven years of my professional life have been given in connection with the care of the insane, to the more peaceful and more adequately compensated walks of private professional practice.

"I need scarcely say that this step which terminates the pleasant official relations which I have been permitted to have with yourself, as well as with my associate commissioners and the officers and employes generally of the department for the insane, is not taken without a feeling of sincere regret on my part.

"In conclusion, I would take occasion to express my deep sense of personal obligation to you, as well as to your predecessors, Governors Hill and Flower, for the confidence, encouragement and support whch you and they have at all times extended to me in the discharge of the arduous and oftentime trying duties of my office, and especially for sustaining the Commission in its endeavor to maintain the department of the State government over which it presides on a non-partisan basis."

Of the value and extent of the service rendered by Dr. MacDonald to the people of this State in the seven years of his membership of the Commission, few persons not directly and intimately connected with the general administration of lunacy affairs can have any adequate idea. To him more than to any other one person may be assigned the chief meed of praise for the final establishment of the policy of State care on a stable and durable basis, as an effective, economical and practical measure of dealing with the largest and most costly of the State's charities. In securing the adoption by the Legislature of this policy, and in the subsequent improvement, enlargement and extension of the work, his services have been of the first importance. Indeed, the commanding value of his connection with the Commission and the loss it will sustain in the severance of his relations to it would be difficult to over-estimate. Dr. MacDonald's entire professional life has been spent in the special field of psychiatry, and he has attained the highest honors in the gift of the State in his department of medicine.

How his retirement is viewed by those best qualified to judge, viz., the State hospital superintendents, appears from the following, adopted at a meeting of representatives of the ten State hospitals:

WHEREAS, The superintendents and representatives of the State hospitals of New York, in conference assembled, have learned with deep regret of the contemplated retirement of Dr. Carlos F. MacDonald from the presidency of the State Commission in Lunacy; therefore,

Resolved, That as representatives of the State hospitals for the insane, we deem it appropriate and fitting to make public acknowledgment of our appreciation of the important service rendered by Dr. MacDonald on behalf of the establishment, upon a permanent basis, of the policy of State care for the insane, and of carrying out that policy into practical operation in an efficient and economical manner. We also record our regret that Dr. MacDonald has found it necessary to withdraw from the service of the State in that capacity; and we tender him the assurance of our confidence in the administration of lunacy affairs by himself and his associates. Our thanks are due to him for his efforts to promote the welfare of the insane and the successful conduct of the State hospitals, and for his future prosperity and success he has our heartiest wishes.

A copy of these resolutions, handsomely engrossed on parchment, was presented to Dr. MacDonald, together with an elaborate and costly solid silver punch bowl.

Dr. Wise, the new President of the Commission, has given a quarter century to service of the State and the care of its dependent insane. In 1873 he was appointed assistant physician and in 1884 he was promoted to the medical superintendency of the Willard Asylum. In 1889 he accepted the medical superintendency of the new St. Lawrence State Hospital at Ogdensburg. The latter institution was conceived in a most enlightened spirit of progress, and was intended to be an exponent of the latest and most approved plans of hospital construction and administration. In the seven years of Dr. Wise's incumbency the policy of the hospital and basis of its organization has been completed. It is recognized throughout the scientific medical world as a model of convenience and adaptability for its purpose, and has already attained a high reputation as a curative institution. Dr. Wise thus brings to his new position a mature experience gained in long and active duty in the great department of which he is now the head. Dr. Wise was highly commended by Dr. MacDonald as his successor, and the Governor's action in appointing him is most commendable.

MEDICAL EXCERPT.

By T. P. CORBALLY, A.M., M.D.

PERITONITIS.—Professor Dieulafoy lately presented (*Gazette Hebdomidaire*, Nov. 1) a most interesting communication to the Academie de Medicine on that form of peritonitis that follows typhoid fever. He makes a distinction between peritonitis caused by perforation and peritonitis by propagation. This latter form, accepted by Jaccoud and Thirial and many others, does not exist, in the opinion of Dieulafoy. "It is almost always," he says, "a peritonitis caused by a lesion of the appendix, a paratyphoid case of appendicitis which will often be best remedied by an operation."

The indications for operating in cases of intestinal perforation are the subject of an exhaustive study in the memoir of M. Dieulafoy. "It becomes the very difficult part of the physician sometimes to point out the indications, to select the suitable time and to have recourse promptly to the services of the surgeon."

Some of the intestinal perforations are produced in a very insidious manner in patients having typhoid fever. These cases seem to have little acute pain; there may be no hiccough, tympanism is not a prominent feature, but a sudden lowering of the temperature below 37 per cent. is a very important indication when it coincides with a marked increase in the gravity of the general condition. In cases of intestinal hemorrhage there is also a rapid fall of the temperature, but in this case the temperature soon rises again.

"Cases of typhoid peritonitis by *propagation*, as designated in the classification since Thirial," says M. Dieulafoy, "do not exist; when a case of abdominal typhus succumbs with symptoms of a peritonitis from perforation, when the intestinal perforation cannot be discovered, it becomes necessary to look carefully for a fissure of the intestine which, however limited it may be in extent, is still sufficient to explain the pathogenic origin of the peritonitis by perforation, it becomes necessary to examine if the peritonitis is not the consequence of an infection of the ganglionic system; to a perforation of the bilary vessicle; and it is necessary, above all things, to examine with the utmost care the ileocaecal appendix, which much more frequently than has been suspected hitherto is the cause of peritoneal disease."

The appendix which abounds in lymphatic tissue can, like the intestine, be easily perforated in the neighborhood of Peyer's glands, and then there are the same symptoms that are found in cases of intestinal perforation.

In some cases, even where there is no perforation, a true appendicitis may exist.

Sometimes the disease is limited to an attack of acute appendicitis, without peritoneal complications; sometimes the attack of appendicitis is followed with a limited peritonitis, or of encysted peritoneal abscess; finally, the attack of appendicitis may be the initiatory stage of peritoneal septicimia or of a peritonitis more or less general.

How, then, explain the pathogenic condition of these cases of paratyphoid appendicitis? These cases of appendicitis are the consequence, the remnant of the lymphatic lesions of the typhoid fever. They are less severe than peritonitis resulting from perforation; they are recognized with difficulty. It is necessary to look for the point made by Mac Barnay, to examine the degree of abdominal sensibility, and particularly to remember that, in these cases the temperature rapidly rises instead of falling, as in the case of peritonitis from perforation.

Many cases clearly prove that paratyphoid appendicitis may be followed by all the complications of the usual forms of appendicitis, from acute general peritonitis, by metastasis, the appendix not being perforated, or to pyelo-phlebitis and abscess of the liver.

There are, then: 1st. Peritonitis resulting from perforation, which occurs usually during the active stage or during the relapses of typhoid fever. The perforation may be in the ilium, the caecum, the appendix or the colon. These cases of peritonitis from perforation are not necessarily the consequence of severe cases of typhoid fever; they are found quite as often in mild forms of the disease. The symptoms that indicate peritonitis from perforation may be mild, but whether they be mild or severe there is generally a valuable symptom in the rapid fall of the temperature, often below the normal condition. Cases of peritonitis from perforation are always very grave, yet they may be limited in severity from the beginning by adhesions which prevent in time the extent of the perforation.

2d. There are cases of paratyphoid appendicitis which usually follow in the course or during the convalescence from typhoid fever. Such cases are usually accompanied with a return of the fever and an elevation of the temperature, conditions that distin-

guish them from peritonitis caused by perforation. They are ushered in like a fatal case of appendicitis; the process of infection may be limited to a simple attack of appendicitis without any of the symptoms of peritonitis; it may also (with or without secondary perforation of the appendix) terminate with all the complications of appendicitis; peritonitis encysted, general peritonitis, abscess of the liver or abscess remote from the center of the disease.

3d. The so-called typhoid peritonitis by propagation, such as it has been understood and described since Thirial does not exist.

Treatment.—The treatment may be divided into two classes; medical, which is of little value; surgical, which is advisable in a far greater number of cases, always taking care to separate the different kinds of peritonitis complicating typhoid fever.

(*a.*) In the case of typhoidal peritonitis and of appendicular typhoidal peritonitis, the operation is performed under the most favorable conditions; it is followed by the best results, provided it is made at the proper time.

(*b.*) In the case of typhoidal peritonitis from perforation, the operation gives the patient some chance of recovery. The difficulty is to select the most suitable time for the intervention.

(*c.*) Notwithstanding the ulcerations of the intestines the suture, in such cases, usually terminates in cicatrisation of the perforation; surgical interference is therefore perfectly proper.

Obliteration of the Superior Vena Cava.—M. Achard recently presented to the Societe Medicale des Hopitaux a patient showing a complete obliteration of the superior vena cava. The superior half of the body of the patient was of a rose color; the superior extremity on the right was very oedematous. The jugular veins formed thick cords—full, hard and salient. The oedema was not well marked, except on the right; the face was not cyanosed, but puffed; but six weeks after the beginning of the attack the oedema was general over the face, the neck and the superior extremities. This rapid change corresponded with the collateral circulation in which a corresponding change took place.

Pain and Rest in Diphtheria.—Rest is one of the sweetest words in our language, and in the management of no disease is this more true than in diphtheria. In keeping with the experience of Professor T. E. Murrell, ex-Vice-President of the American Medical Association, and Dr. Pollack, of St. Louis, who have found antikamnia valuable as a reliever of the pain of nocturnal earache;

it has also been found of great value as a sleep producer in these cases. Given in doses of two and a half to five grains every two to four hours, there is no depression, nor have other than satisfactory results obtained. Dr. Eggers, of Horton Place, St. Louis, reports in the treatment of an attack of diphtheria in a member of his own family that, to obtund the pain consequent upon the injection of anti-toxine-serum, which ordinarily lasts from three to four hours, he exhibited antikamnia internally, securing relief in a few minutes. In the treatment of any neuroses of the larynx, coughs, bronchial affections, la grippe and its sequelae, as well as chronic neuroses, clinical reports verify the value of codeine in combination with antikamnia, the therapeutical value of both being enhanced by combination.

FELLOWS' SYRUP OF HYPOPHOSPHYTES is alike commendable as one of the most acceptable and efficient tonics in the treatment of what are commonly called the wasting diseases of children, due to defective nutrition, for which this preparation is one of the best of remedies.

THE USE OF PROTONUCLEIN IN THE TREATMENT OF ULCERS.—"It is a well-known fact," says Dr. Louis Cohn, of New York (Polyclinic, Nov. 15, 1896), "that of the regular clientele of a surgical dispensary, patients suffering from some form of chronic ulceration constitute the greatest number. Considering that treatment in such cases must extend over a more or less prolonged period in order to be successful, and that most of these patients possess migratory tendencies, which are carefully nursed by friends who are constantly recommending different doctors and dispensaries, it is not to be wondered at that in a great many instances the final outcome of a certain line of treatment cannot be fully observed. In my dispensary work it has been, therefore, a somewhat difficult task to test the various local applications in the treatment of chronic ulcers, and then to come to some definite conclusion as to their respective merits, for while a number of cases improved and others got well under each line of treatment, a great many remained uncured or the patient disappeared from sight before much had been done. The various methods of local treatment comprised the use of ichthyol 10 per cent., ung. diachylon, lead paint, acetanilid and bismuth, and strapping with diachylon plaster. The best results were achieved by the application of the latter, but there were a number of cases where this failed. In some of the patients the local treatment was supported by internal administration of remedies appropriate to the demands of the condition present.

"We had just about concluded to award the prize of superiority to the use of diachylon plaster, when a pamphlet describing the nature of protonuclein reached our hands. The preparation of the drug is based upon the fact that all living beings possess some property which enables them to resist poisonous influences.

"According to the view of Dr. Wyeth, as given in his well-known standard text-book of surgery, an ulcer is the result of molecular death in the integument of mucous membrane and the underlying areolar or submucous tissue. As molecular death is caused by a loss of nutrition in these parts, it looked to me as if protonuclein was the magic agent that could restore life by stimulating the leucocytes and thus vitalizing the parts affected. I determined to give it a fair trial."

The result is shown by the citation of a number of most unpromising cases treated with this agent with surprising success, and a statement of his belief that a trial of the preparation will yield remarkable results in every case of stubborn and unyielding ulceration.

The results were so uniformly good that the use of protonuclein in all ulcerative processes was found to be an ideal measure.

EDITOR'S TABLE.

SANITARIAN, DECEMBER NUMBER, 1896.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

A CENTURY OF VACCINATION.

As briefly summed up by a recent number of the *British Medical Journal*, the results of vaccination during the century of its practice are very striking. It was on May 14, 1796, that Jenner performed his first successful vaccination. The average mortality from small-pox in Europe during the century preceding vaccination was, in the cities alone, 3,000 per 1,000,000 inhabitants; including the country parts, it was somewhat over 2,000 per 1,000,000 inhabitants. Owing to frequent epidemics of small-pox, the mortality rose occasionally to between 5,000 and 6,000 per 1,000,000 inhabitants. In the century since vaccination, the mortality from small-pox has not been one-tenth of that figure, as we shall see by taking statistics from individual countries.

In England the mortality rate was over 2,000 per 1,000,000 in the last century; during permissive vaccination the rate fell to 417 per 1,000,000, and during compulsory vaccination from 1871, the mean rate has fallen to 53. The distance from a mean ante-vaccination mortality rate of 2,000 to a mean compulsory vaccination rate of 53 is a long distance!

In Sweden, the quarter century preceding vaccination the mean mortality rate from small-pox was 2,045 per 1,000,000 inhabitants. During the fifteen years 1802-16 of permissive vaccination, the rate fell to 480; and during seventy-seven years (1817-94 of compulsory vaccination it fell to 155. This is not as good a result as in England; but still it is a material tumble from the ante-vaccination death rate of 2,045 per 1,000,000 inhabitants to the compulsory vaccination death rate of 155!

Prussia furnishes the finest example of immunity from small-pox through rigorous vaccination. Her ante-vaccination mean death rate from small-pox was over 2,000; during the permissive period it fell to 309; and during the compulsory period since 1874, the mean rate has been only 15 per 1,000,000 inhabitants! Italy during the permissive period had a mean death rate from small-pox of 440; during the later compulsory period the rate has fallen to 110. Austria and Belgium practice vaccination, not by compulsion; and in the former the mean rate is 580, and in the latter 441. Spain does not practice vaccination generally, and her death rate from small-pox in the single year 1889 was, in these provinces: Almeria, 3,080; Murcia, 2,670; Corunna, 1,230; Malaga, 1,340; Cadiz, 1,330; Cordova, 1,400. In Germany that same year the death rate from small-pox was 4.

THE LOOMIS SANITARIUM FOR CONSUMPTIVES.

The Loomis Sanitarium for Consumptives in Liberty, Sullivan county, New York, was dedicated November 20. Thus a great charity was formally opened, although the institution has been receiving patients since June, and the demand for accommodation has been so great as to necessitate the use of wards originally intended for emergency cases. The present capacity is thirty-one beds, and there is urgent need for more cottages. Thirty patients are now awaiting admission.

The Sanitarium is in accordance with the desire and plan of the late Dr. Alfred L. Loomis, and is the outgrowth of the hospital established by him at No. 230 West Thirty-eighth street. He selected Liberty as the site of the institution, and said he wished it to

be under the direction of a board of managers consisting entirely of ladies.

His friends decided about a year ago to carry out his plans. They organized the Loomis Sanitarium for Consumptives, and raised funds through voluntary subscriptions. So successful were they that work on the main building was begun as soon the exact site could be selected.

The ground contains 150 acres among the mountains, three miles from Liberty and 2,200 feet above the sea. The administration building, the gift of Mr. J. Pierpont Morgan, is of gray stone, three stories and completely equipped in accordance with the most approved plans.

A casino, perfect in its appointments, has been built by Mrs. George Lewis, and there are completed and furnished four cottages, on the gift of William D. Sloane.

A feature of the Sanitarium is the electric plant, which not only furnishes power and light, but has one of the best equipped Roentgen-rays apparatus in the State.

The Thirty-eighth Street Hospital is free to incurables, and it was the numerous applications made there that suggested the Sanitarium, which is restricted to patients who have passed an examination by the Board of Physicians and been declared curable. The examining physicians are: Dr. H. P. Loomis, of No. 58 East Thirty-fourth street; Dr. C. E. Quimby, of No. 44 West Thirty-sixth street, and Dr. J. E. Stubbert, at the Sanitarium, who is also physician in charge.

Many persons from New York took part in the dedication. They went to Liberty as guests of Mr. J. Pierpont Morgan, starting in the morning on a special train on the Erie Railroad and returning at 10:30 o'clock in the evening. Mr. Morgan accompanied his guests, among whom were Bishop Potter, the Rev. Dr. Bridgman, of Holy Trinity Church; the Rev. Dr. Mottet, of the Church of the Holy Communion, and the following members of the Board of Managers:

Mrs. Richard Irvin, President; Mrs. Chapman, Vice-President; Mrs. William Chandler Casey, Secretary; Mrs. Alfred L. Loomis, Treasurer, and Mrs. J. H. Aldrich, Mrs. James Lent Barclay, Mrs. George H. Bend, Mrs. H. Mortimer Brooks, Mrs. John N. Beekman, Mrs. Coppenhagen, Mrs. William C. Whitney, Miss E. V. Cockroft, Mrs. Frederick Goodridge, Mrs. Huntington, Mrs. John A. Lowery, Mrs. George Lewis, Mrs. John D. Prince, Mrs. Robert

Waller, Mrs. Ferdinand Wilmerding and Mrs. Robert Winthrop.

Besides these there were former Mayor Hewitt, J. D. Prince, Dr. and Mrs. H. P. Loomis, Mr. Bruce Price, Mr. William C. Whitney, Mrs. William Douglas, Mrs. Henry Mottel, Mr. Charles Barney, Dr. E. J. Fondice, Miss Radcliffe, Dr. J. C. Edgar, Mrs. Delafield, Mrs. Ely, Miss Patterson, Miss Rollo and Mr. and Mrs. F. L. Stilsen.

The dedicatory services were conducted by Bishop Potter, assisted by the Rev. Drs. Bridgeman and Mottet and the Rev. Dr. Thomas, Archdeacon of Orange. A choir, composed of inmates of the Sanitarium, furnished the music. Bishop Potter reviewed the objects of the institution as designed by its founder and spoke of the large endowments, but did not mention the names of the donors. He said it was fortunate that the institution had as a board of managers such an accomplished company of ladies, and predicted for the Sanitarium under their management unbounded success in the blessings it would bring suffering humanity.

Luncheon was served after the dedicatory exercises.

CLEANING OUT BROOKLYN'S RESERVOIRS.

JAMAICA, L. I., November 21.—[Special to the *Eagle*.]—Five miles southeast of Jamaica Village, at the Simonson twin ponds, fifty or sixty men, working like beavers, are digging out the black, foul-smelling mud from the bottom of one of the large ponds from which the city obtains its water supply, and wheeling it in barrows up the narrow plank inclines to the elevated banks of the pond, where it is dumped at such a distance that there is no danger of its being washed back into the pond. A bank of mud from four to five feet in height, fifty feet in width and from 1,200 to 1,300 feet in length has thus been removed from the larger of the two ponds which flank the Merrick macadamized road. This mud, which for years has formed the bottoms of the ponds, has become crusted with a growth of both growing and decaying grass, weeds and other vegetable matter, which has further polluted the water. Old residents of the locality say the ponds have not had a thorough cleaning out since they were first used for the water supply of Brooklyn, and these are about the oldest ponds of the present Brooklyn water-supply system.

The work of cleaning has been actively under way at the Simonson ponds since October 9. All the other ponds, six in number, which contribute to Brooklyn's water supply, and extend from Jamaica to Hempstead along the south side of the island, will be

cleaned in turn, the work being continued through the winter and spring months until it is completed.

The mud is the result of the accummulations of many years of dust and leaves blown in from the highway and forests and the decay of vegetable matter in the ponds; also of the silt and decaying vegetable matter brought down by the brooks that feed the ponds. Before the work of digging was commenced the water was all let out of the ponds by opening up the sluiceways and by means of a canal dug through the center of the bed of each pond, through which the water is conveyed to the mains. It has been found that the supply from springs in the bottom of the pond has largely increased since the layer of mud has been removed and the canals have been enlarged to provide for the increased volume of water that flows through them. It is expected that the water supply of the city will be increased by the removal of the mud.

Such is the nature of the material to be removed, but the work must be done wholly in cold weather, as the emanations from the exposed pond bottoms and the stirred up mass would breed malarial diseases. During the warm days of last week foul gases arose from the exposed bed of the pond; many men were taken sick and had to leave the job. * * *

Nevertheless, a distinguished chemist has been employed by the Department of City Works to ascertain the source of the bad odor and nauseous taste of the water during the past summer, and still retained in some degree, and an appropriation made by Common Council to establish a biological laboratory under the department's auspices to search for the untidy germ alleged to be responsible for the mischief.

THE CONDITION OF THE KINGS COUNTY HOSPITAL, again brought to the front by a recent official report, has been a standing disgrace to the Brooklyn City and Kings County authorities for more than twenty years. The hospital was built in 1842 when the county had a population of not more than 50,000. The people have long known that the hospital was crowded beyond its capacity. They have known that twenty patients were put into wards built to accommodate ten, and that there were no separate wards for convalescents. There are now more than 1,000,000 people within the same territory, and if it had not been for the activity of private citizens in building and endowing hospitals, this institution would have been long since a nest for typhus fever. About twenty years ago this writer was for a time one of the official

visitors of the institution. Its overcrowded condition was then urged, as now. Appropriations were made and have been since made from time to time, all along, for the improvement and support of the institution. But while the use of the appropriations has been in charge of the officials, the poor have been virtually left to the charge of private charities. Thus the people at large, through the exercise of benevolence to the poor, regardless of exactions from officials who have been provided with the means for their support, have virtually condoned the neglect of the unscrupulous officials.

SCHOOL BATHS.—The Boston School Board, believing that present circumstances and conditions warrant such an innovation, have decided in the affirmative by voting to provide bathing facilities in the new Paul Revere School, and the result of their experiment in this direction will be awaited with considerable interest, not only by parents, but by the children as well, and by all sanitarians.

This scheme of introducing baths into the public schools originated early in the present year with Mr. Dutton, the principal of the Hancock School on Parmenter street. But *the* scheme was originally urged fifteen years ago by the late Sir Edwin Chadwick, of London.

Dr. Durgin, in giving expression to his firm faith in the plan as suggested, emphasized the statement that opposition would only come from those who did not or would not realize its value, and in such cases he believed it was time to act definitely and decidedly.

As to the rules which would govern the use of the baths and compulsory bathing, Dr. Durgin said he did not think the authorities would act hastily or do anything that would in any way be against the wishes of the parents of the children.

THE SCANDAL ON OYSTERS.—At the recent meeting of the British Medical Association, Professors Boyce and Herdman took pains to show what persons familiar with the natural history of the oyster have known all along, that it is not a scavenger, as some people have ignorantly alleged, but a cleanly and docile animal of slow movement and over-trustful of its pampering caretakers. Consequently it has been most foully treated. The professors cited and verified facts that had been before stated—namely, that when oysters were laid down in pure water a natural process of cleansing took place, and previous sewage contamination was thus entirely got rid of. This result forms the highest possible argument in favor of the absolute purity of the surroundings of oysters during their cultivation or after being laid down in special beds for fattening purposes.

With regard to the germs of typhoid fever in sea water or in the tissues of the oyster, it was shown that they are viable for fourteen days in sea water at 35 degrees centigrade, while in cold sea water they may live for twenty-one days; and when large quantities of the microbes are added to the water, their presence may be demonstrated for a longer period than when small quantities are employed. It thus seems that the bacilli do not actually breed or multiply in the sea water at all. Infection from this source, therefore, is from germs that have entered the water, and not from their descendants or progeny. It was also demonstrated that the typhoid microbe does not increase either in the body or in the tissues of the oyster. Where oysters are infected with typhoid germs and placed in a stream of pure sea water, the bacilli disappear in from one to seven days. The oyster evidently utilizes its pure environment to get rid of its unwelcome and uninvited germ guests.

MORTALITY AND MOBILITY REPORTS AND REVIEWS.

Diphtheria, the reader will hardly fail to observe in what follows, has greatly increased in prevalence and mortality throughout the country over any corresponding period. Moreover, our notes appended to the official reports referring to its epidemic prevalence, omit hundreds of other places where its existence is reported. In many localities, but in none more than Brooklyn, it appears to have acquired a chronic abiding place and an annually recurring epidemic prevalence during the late autumn and winter months, notwithstanding—indeed, probably on account of—the too exclusive attention to the improvement in the treatment of the disease. Reports received by us, at any rate, official and otherwise, confirm our own observations, that the improvement in the treatment of the disease appears to have diverted attention from local conditions and practices promotive of its seasonal prevalence—such as filthy stables and manure storage; the exposure of foods of all kinds to street dust; unclean grocery cellars; sweatshops of all sorts, etc.—subjects of common reference in these pages.

HEALTH OF THE ARMY.—*Report of the Surgeon-General for the fiscal year ending June 30, 1896*:

The health of the army during the year 1895 was excellent. The mortality rate from all causes was 5.16 per 1,000 of strength as compared with 6.69 in 1894; 7.85 for the preceding decade, and 6.33 in 1889, the year of lowest previous record. The rate of discharge for disability per thousand was 9.15 as compared with 13.30 in 1894. The number of discharges was 250, of which 186 were for disease

and 64 for injury. The number of deaths was 141, of which 44 were occasioned by injury, 21 were caused by gunshot wounds, 17 by diseases of the respiratory organs and 15 by diseases of the digestive organs. The record of sickness among the troops is reported as the best yet shown by statistics. The number of men constantly sick per thousand was 26.40 among the colored men and 34.54 among the white. Each colored soldier of the command lost 9.6 days on account of sickness during the year and each white soldier lost 12.6 days. These figures show that the colored men make the hardiest soldiers. The susceptibility of the negro troops to disease was noted as greater than that of the whites only in the instances of rheumatism and neuralgia; although it was equal to or slightly in excess in several other diseases, as tonsilitis, colic, constipation and conjunctivitis. The mean strength of the command, officers and men, white and negro, from which medical reports were received during the year amounted to 25,204; white, 23,195; negro, 2,009.

Health of the Military Departments.—The admission rate varied from 796.32 in the Department of the Columbia to 1,355.63 in Texas. It was above the army average only in the Departments of Texas, the East and the Platte.

The rate of constant sickness was highest in Texas. The Departments of the Columbia, Dakota, California and the Colorado had low rates; the other departments did not differ much from the army average.

There was little variation in the discharge rates of the various departments, the extremes being 6.01 in the Platte and 10.62 in Texas.

The death rate varied from 3.21 in the Department of the Platte to 7.54 in that of the Missouri.

The Department of Texas had the worst record; the Department of the Columbia had probably the best, but, if so, it was closely followed by the Departments of Dakota and of California.

ALABAMA.—W. H. Sanders, M. D., State Health Officer, Montgomery.

Selma, 7,622: J. A. McKinnon, M. D., Registrar, reports for October: Total mortality, 12, of which 5 were under five years of age; annual death rate, 18.8 per 1,000.

Mobile, 31,076: J. A. Abrahams, M. D., Health Officer, reports for September: Deaths, 99—14 under five years of age. From consumption (all colored), 15; annual death rate, 21.44.

CALIFORNIA.—J. H. Davidson, M. D., President, Los Angeles; J. R. Laine, M. D., Secretary, Sacramento. The Secretary reports for October: Returns from 44 cities, towns, villages and sanitary districts, aggregating a population of 663,430, show a mortality of 880, an annual death rate of 15.84 per 1,000. There were 141 deaths from consumption, 58 from pneumonia, 12 from bronchitis, 7 from congestion of the lungs, 21 from typhoid fever, 11 from diphtheria and 12 from cerebro-spinal fever.

San Francisco, 330,000. Reports for October: Deaths, 506—137 under five years of age. From consumption, 75; acute pulmonary diseases, 49; from zymotic diseases, 40; annual death rate, 18.36.

Los Angeles, 100,000. Reports for October: Deaths, 110—21 under five years of age. From consumption, 30; acute pulmonary diseases, 5; from zymotic diseases, 14; annual death rate, 13.20

COLORADO.—*Denver*, 150,000: William P. Munn, M. D., Health Commissioner, reports for October: Deaths, 115, of which there were from typhoid fever, 122 cases reported, 17 deaths; diphtheria, 54 cases, with 4 deaths; scarlet fever, 18 cases; from consumption, "contracted elsewhere," 17; annual death rate, 9.20.

The Sheridan school has been closed because of the prevalence of diphtheria; 300 scholars have been attending the institution up to two weeks ago, and since the attendance diminished until but 75 were present, and the directors concluded that further use for the teachers would be dispensed with until the conditions changed.

CONNECTICUT.—Professor William H. Brewer, Ph. D., New Haven, President; Professor C. A. Lindsley, M. D., Secretary, New Haven.—The Secretary's bulletin for October comprises reports from 164 towns in the State, with an aggregate population of 851,040, from which the number of deaths reported for the month was 1,097. The death rate for the larger towns is 15.6; for the smaller, 14.9, and for the whole State, 15.4. Deaths from zymotic diseases, 174—15.8 per cent. of the total mortality—chiefly from diarhoeal diseases, 42; diphtheria, 61, and typhoid fever, 24.

November 7-10: *Diphtheria* is reported to be increasingly prevalent in Waterbury, Derby and Bridgeport. Middletown (Nov. 9) is threatened with a water famine, not more than thirty days' supply of water in the reservoir, and unless heavy rains soon come, pond and river water will have to be used. The low water has already caused many cases of malarial and typhoid fever.

There is said to be more cases of sickness here now than in any month this year, much of it being intermittent in character.

DISTRICT OF COLUMBIA.—White, 187,600; colored, 87,900—275,500. W. C. Woodward, Health Officer. Nov. 10th: Diphtheria increasing.

DELAWARE.—F. W. Cooper, M. D., President, Camden; E. B. Frazer, Secretary, Wilmington.

Wilmington: Diphtheria is increasingly prevalent. Nov. 4th: Fifteen new cases have been reported in the past ten days, and on the last day of October there were 30 cases under treatment.

The Health Officer's report for the fiscal year ending June 30: Deaths, 5,904—2,702 colored. There was an increase of all zymotic diseases over the previous year. From typhoid fever there were 228 deaths, and of these 194 occurred in the first six months of the year; 99 of them in the last three months. Deaths of children under five years of age, 2,094—1,122 colored, 35 per cent. of the total number of deaths.

Returns of 4,706 births were received and recorded during the year, while last year they numbered 4,794, and for the average of the last six years, 4,548. Of the births 2,786 were white and 1,920 colored. There were 617 illegitimate births (white, 100; colored, 517). Of marriages, 2,237 returns only were received and recorded, 1,488 of which were of whites and 749 colored, although according to the records of the clerk of the court, there were 3,168 marriage licenses issued. The returns last year numbered 2,391. For the last six years they have numbered 1,346 per annum.

Referring to contagion in the schools and the necessity for closing and disinfecting them, the Health Officer urges better provision for hat and wrap rooms, and an appropriation for the maintenance of a public disinfecting service.

ILLINOIS.—William E. Quine, M. D., President, Chicago; J. W. Scott, Secretary, Springfield.

Chicago, 1,619,226. William R. Kerr, Commissioner. Report for October: Deaths, 1,726—600 under five years of age. From diphtheria, 175; typhoid fever, 143; whooping cough, 27; consumption, 221; other tubercular diseases, 41; annual death rate, 12.84. October 15-November 9: Diphtheria is reported prevalent throughout the State. Many cities and towns have closed their schools on account of it, and its mortality is now greater than it has been for several years.

INDIANA.—Douglass C. Ramsey, M. D., President, Mount Vernon; J. N. Hurty, M. D., Secretary, Indianapolis.

Diphtheria is reported increasingly prevalent at many places in

the State. Fatalities are daily occurring and new cases are being reported. The disease is especially general at Hope, western Shelby; and Rush and Franklin counties also report a number of cases.

Indianapolis (*Sentinel*) Nov. 1: City Sanitarian Clark announced yesterday that diphtheria is becoming widely prevalent in the city. It is not yet epidemic, he says, but a number of cases are reported every day.

Dr. Edmund D. Clark has been appointd City Sanitarian of Indianapolis, to succeed Dr. Charles E. Ferguson, who has been elected Superintendent of the Indianapolis City Hospital. Dr. Clark had been for some time assistant to Dr. Ferguson previous to his appointment, and he is generally deemed to be eminently qualified for the duties of the office.

IOWA.—E. H. Carter, M. D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

Des Moines (*Capital*), Nov. 5: The Secretary reports an unusual prevalence of diphtheria and scarlet fever in the State, in consequence of which, in many places, the public schools are closed. Measles is reported epidemic in Worcester.

Davenport, 31,484.—A. W. Cantwell, M. D., Physician, reports for October: Number of deaths, 30—8 under five years of age. Death rate per 1,000, 12.1. Zymotic disease caused 1 death, and consumption 1.

KANSAS.—T. E. Raines, M.D., President, Concordia; T. Kirkpatrick, M. D., Secretary, Westphalia.

Topeka (*Journal*), Oct. 27: There are now 15 cases of diphtheria in the vicinity of the Central schoolhouse, South Haven, and up to this writing there have been 3 deaths. Diphtheria is also reported prevalent in Seabrook and Atchison.

KENTUCKY.—Joseph Matthews, M. D., President, Louisville; J. N. McCormick, M. D., Secretary, Bowling Green.

Henderson (*Gleaner*), Nov. 7: *Typhoid fever* is prevailing with peculiarly deadly effect in some parts of Barren county. Diphtheria is reported alarmingly prevalent in several places in the State, requiring the closure of the schools.

LOUISIANA.—R. S. Oliphant, President, New Orleans; G. F. Patton, M. D., Secretary, New Orleans.

New Orleans, 275,000—80,000 colored: Deaths in September, 452; colored, 158—138 under five years of age, 42 colored. Deaths from consumption, 54; pneumonia, 14; bronchitis, 19; *small-pox*,

1; cholera infantum, 7; enteritis, 11. Death rates: Whites, 18.09; colored, 23.70; 19.72.

Small-pox at *Patterson* (*Times-Democrat*): Franklin, La., Nov. 11.—Dr. C. M. Smith, Health Officer of this parish, has just reported that small-pox has broken out with great violence at the colored settlement a few hundred yards above the town of Patterson, there being now some 25 or 30 cases.

MARYLAND.—John Morris, M. D., President, Baltimore; John S. Fulton, M. D., Secretary, Baltimore.

Baltimore *American*, Nov. 6: The Executive Committee of the State Board of Health has determined upon a thorough investigation into the local causes of typhoid fever, diphtheria and other infectious or contagious diseases throughout the State, a preliminary examination already made having determined to some extent localities to which more particular attention will be paid. The Secretary of the Board, Dr. J. S. Fulton, said yesterday that the investigation was intended to be thorough, and would include, after the foci were determined, the whole sanitation of neighborhoods, including water supply, drainage, vegetation, etc. The Board will also work largely through county boards of health, county commissioners and the country press for the dissemination of literature and general information upon diseases and their treatment, and upon sanitation generally as a preventive of disease, so far as can be done with the very limited appropriation made by the State—only $2,500.

Diphtheria is reported prevalent in Talbot county, Cambridge and St. Michaels.

Baltimore, 506,398—75,301 colored. James F. McShane, M. D., Health Commissioner, reports for October: Deaths, 879—696 white persons and 183 colored. Death rates: Whites, 19.83; colored, 30.61; 20.84; 318 were children under five years of age. Deaths from consumption, 87; pneumonia, 54; cholera infantum, 16; typhoid fever, 28; infectious cases, 237.

MASSACHUSETTS.—H. P. Walcott, M.D., Chairman, Cambridge; S. W. Abbott, M. D., Secretary, Boston.

The Twenty-seventh Annual Report of the State Board for the year 1895, a volume of nearly 900 pages, comprehends, as usual, a lucid description of a large amount of work for the protection of the health of the people and of great practical utility to other communities. It is divided into two parts, the first states the work done under the statutes, which define the work of the board and contains a summary of the vital statistics of the State for 1894. The second

part contains the fuller details of the work of the board under the acts relating to water supply and sewerage, food and drug inspection, infectious diseases, and such papers relating to special topics as the board has deemed it desirable to publish.

With regard to infectious diseases, there was no serious epidemic during 1895. *Diphtheria* increased slightly in the number of cases over the prevalence of the previous year, but was less fatal than formerly because of improved methods of treatment.

Deaths from typhoid fever and scarlet fever were fewer than in either 1893 or 1894, and those from measles greater than in 1894, but less than in 1893. From small-pox there was not a single death, and but one case of illness from this disease reported to the board during the year. In the previous year there were 185 cases of small-pox, with 32 deaths.

Regarding typhoid fever, one of the most common means by which it is spread among the population is the milk supply. Epidemics of this character have been investigated by the board in recent years in Cambridge, Somerville, Woburn, Springfield, Marlboro and Newton. Three epidemics in different years have occurred in Cambridge, all of them apparently due to polluted milk, either at its source at the producing dairy farms, or at the place of collection for distribution. Hence the importance of securing the greatest care in preventing the occurrence of the disease among persons employed either at the dairies or at the places where the milk cans are handled and cleaned, at the final distribution. No person who has the slightest symptoms of typhoid fever should be allowed to engage in these occupations until complete recovery has taken place. Mild or "ambulant" cases are more dangerous than severe ones, in which the sick are confined to bed, since the former are far more liable to infect the milk supply, as has been found in the investigations of the board.

Mortality from consumption is reported as on the decrease, and this is believed to be due to "improvements in ventilation, in the hygiene of industrial operations, the proper selection and inspection of the food supply, the selection of improved climatic conditions, the management of dust in the household and workshop, and, above all, in the proper disposal or destruction of the sputa of the sick." Statistics show that the rate of mortality from consumption has been steadily decreasing for nearly half a century.

No complaints have been made to the board under the provisions of the acts relating to offensive trades. While the plan of requiring notice to be given of the occurrence of infectious diseases was

established nearly a century ago, it was not until within the past 25 years that much care was taken to enforce such laws, and that penalties for neglect to comply with them were provided. Later, other features were added to the original laws which provided for the systematic recording of data by local boards of health and requiring a report by the local board to the State board. Such statutes prove of great value in tracing the cause of epidemics and in devising and providing means for their prevention.

Following the general report is a special report summarising the work done by the board from 1883 to 1895 inclusive, with the report of prosecutions submitted to the Legislature, and the reports of analysts for the year ending September 30, 1895.

During 1895, 7,309 samples of food and drugs were examined, at a total cost for inspection, collection, analysis and prosecution of $11,375.89. The number of prosecutions conducted during the year was 92, and the number of convictions 86, or 93.5 per cent.

In the previous report of the board reference was made to the initiated work for the production of anti-toxin and its distribution to boards of health throughout the State. Dr. J. L. Goodale was engaged to take charge of this department, and to his energy and enthusiasm were due much of the success which attended the early efforts in this branch of work. During 1895, however, it was deemed advisable to enlarge the scope of the work, and the services of an expert, Dr. Theobald Smith, were obtained. Dr. Smith has given his whole attention to the production of anti-toxin and to making investigations in such new fields of inquiry as might be presented. A laboratory was established in the building known as the Bussey Institution, near the Forest Hills station of the New York, New Haven and Hartford Railroad. There the work of examining cultures in suspected cases of diphtheria was entered upon, and later the examination of sputa suspected of containing the bacilli of tuberculosis.

The appearance of malarial fevers in regions hitherto uninvaded has suggested the examination of the blood of malarial patients. Circulars have been sent to local boards of health offering the services of an expert in making the necessary diagnostic examinations. The report contains a special paper upon the production of anti-toxin, and in the next annual report information is promised in relation to other branches of bacteriological investigation.

Attention is called to lead poisoning, through the use of lead pipe for the conveyance of drinking water. A number of cases of such poisoning occurred in Kingston. The water furnished to consum-

ers of this town "appears to have acted with unusual power upon lead pipes, especially upon those which were comparatively new." Investigations are now in process with reference to the question of lead poisoning by drinking-water supplies in general, and this question will be the subject of a future report.

The report gives a detailed account of the exhibit of the board at the Cotton States and International Exposition at Atlanta, essentially the same as that which was presented at the exposition at Chicago in 1893.

An experiment station has been established by the board for the purpose of investigating the important subjects of filtration of water and of sewage. As a result of knowledge thus obtained, the board has been enabled to give valuable advice to municipal authorities, corporations, firms and individuals in at least four hundred instances. Such advice has been given in cases which involved millions of dollars. In this department have been planned several of the most important and extensive schemes relative to the water supply and sewerage of large communities.

Under this head the report includes papers upon advice to cities and towns, details of the examination of water supplies and of rivers, summary of water-supply statistics and records of rainfall, the hardness of water and methods by which it is determined, methods of determining the number of bacteria in sewage and water, and an account of the sewage disposal works now in operation in this State.

At the time of the printing of this report the board was engaged in making investigations with reference to the sanitary condition of the Neponset meadows, as directed by a resolve of the Legislature enacted in 1895. Reference is also made to investigations being conducted with regard to sewage disposal and drainage in Salem and Peabody.

Boston, 501,083: S. H. Durgin, M. D., Chairman. Deaths in August, 1,134—485 under five years of age. Annual death rate, 27.15 per 1,000. From diphtheria, 28; typhoid fever, 13; consumption, 122; accident, 40. Cases of contagious diseases reported for the month: Diphtheria, 256; measles, 100; scarlatina, 42 typhoid fever, 110.

Plymouth water is suspected (Boston *Journal*, Nov. 1st) of pollution with typhoid fever germs. Nineteen cases of typhoid fever are reported, scattered over the town in widely separated localities, and their origin cannot be charged to any other condition, to which every one has been exposed.

October 20-November 10: *Diphtheria* is reported prevalent in Salem, Fall River, Pittsfield and Waltham. *Typhoid fever* prevalent in Lowell, Cambridge, Brighton and Benton Falls.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

The Secretary reports for the month of October, 1896, compared with the preceding month, pneumonia, diphtheria, influenza and tonsillitis increased, and dysentery and diarrhoea decreased in area of prevalence.

For the month of October, 1896, compared with the average for October in the ten years, 1886 to 1895, pleuritis was more than usually prevalent, and intermittent fever, remittent fever, consumption and dysentery were less than usually prevalent.

Including reports by regular observers and others, *consumption* was reported present in Michigan in the month of October, 1896, at 251 places; *typhoid fever* at 121 places; *diphtheria* at 62 places; *scarlet fever* at 41 places; *whooping cough* at 22 places, and *measles* at 20 places.

Reports from all sources show *consumption* reported at 3 places more; *typhoid fever* at 45 places less; *diphtheria* at 8 places more; *scarlet fever* at 5 places less; *whooping cough* at 8 places less, and *measles* at 8 places more in the month of Octooer, 1896, than in the preceding month.

MINNESOTA.—Franklin Staples, M. D., President, Winona; C.N. Hewitt, M. D., Secretary, Red Wing.

St. Paul, 215,000: Alexander J. Stones, M. D., Commissioner, reports for October: Deaths, 101—31 under five years of age. Annual death rate per 1,000 was 5.64. Deaths from diphtheria, 5; typhoid fever, 4; consumption, 22.

Minneapolis, 225,602: H. N. Avery, M. D., Commissioner, reports for October: Deaths, 149—54 under five years of age. Deaths from diphtheria, 15; consumption, 11; typhoid fever, 6. Death rate for the year ending October 31st, 8.73.

October 20-November 6: Diphtheria reported prevalent in Austin and Morris—the public schools closed.

MISSOURI.—F. J. Lutz, M. D., President, St. Louis; Willis P. King, M. D. Secretary, St. Louis.

St. Louis, 570,000—31,000 colored: M. C. Starkloff, M. D., Commissioner of Health, reports for September: Deaths, 682—207 under five years of age. From diphtheria, 38; phthisis, 89; typhoid fever, 13; diarrhoeal diseases, 37. Annual death rate per 1,000: White, 13.58; colored, 27.3.

Kansas City, 165,000: George A. Coffin, M. D., Sanitary Superintendent, reports for October: Deaths, 148—49 under five years of age. From diphtheria, 18; typhoid fever, 3; phthisis (and tuberculosis), 9. Annual death rate, 10.76.

NEVADA.—(*Independent*, Elko) November 1: *Diphtheria* is making frightful ravages in the *Truckee valley*. Five or six children have already died and more are down with the disease. The attention of the State Board of Health has been called to it, but it is hampered by lack of funds. It is also reported (*Journal*, Reno) October 28, prevalent at *Huffaker's*—several deaths from it and no action taken against its spread.

NEW HAMPSHIRE.—G. P. Conn, M. D., President, Concord; Irving A. Watson, M. D., Secretary, Concord.

At a conference of health officers of the State, under the auspices of the State Board of Health, October 14th, an organization was effected, to be known as the New Hampshire Association of Boards of Health, and a constitution and by-laws were adopted. The objects of the association are the better organization of local boards of health, the advancement of sanitary science in the State, the firmer enforcement of sanitary laws and the establishment of pleasant social relations among members, which were admirably stated in a greeting addressed to the assembly by Dr. G. P. Conn, President of the State Board.

Officers were elected as follows: President, Dr. George Cook, Concord; Vice-Presidents, Drs. C. W. Downing, Manchester; D. M. Currier, Newport; Secretary, Dr. I. A. Watson, Concord; Treasurer, E. N. Pearson, Concord. Executive Committee—Drs. Greeley (Nashua), Towle (Portsmouth), Rodgers (Plymouth), Houghton (Rochester), Pope (Portsmouth), and Collins (Nashua).

An interesting feature of the conference was the exhibition of the *Formic Aldehyde* process of disinfection, by Dr. Irving A. Watson, as fully described on other pages of this number by Professor Robinson, of Bowdoin College. Other subjects were presented and discussed, as follows:

"Words, Wise and Otherwise, upon Modern Sanitation," Dr. C. S. Collins, Nashua; "Relation of State and Local Boards of Health to Each Other and to the People," Dr. Samuel W. Abbott, Boston, Secretary of the Massachusetts Board of Health; "A Plea for Sanitary Marriage and Home," Dr. C. W. Downing, Manchester; "The Prevention of Infantile Diseases," Dr. D. E. Sullivan.

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

Hudson county.—Jersey City and vicinity, 338,671.—W. W. Varrick, M. D., President. During September there were 410 deaths, of which 200 were under five years of age. Annual death rate, 17.4 per 1,000. Diphtheria caused 21 deaths; scarlatina, 2; whooping cough, 13; typhoid fever 7; pneumonia, 34; bronchitis, 11: consumption, 39; diarrhoeal diseases, 19.

Newark, 215,725: Health Officer Chandler reports for the four weeks ending October 31: Deaths, 281—90 under five years of age; from diphtheria, 16; consumption, 38; pneumonia, 21. Annual death rate, 16.9.

Paterson, 103,020: J. L. Leal, M. D., Health Officer, reports for September: Deaths, 137—67 under five years of age; from diphtheria, 15; consumption, 9; pneumonia, 4; diarrhoeal diseases, 9. Annual death rate, 13.24 per 1,000.

November 1-10: Diphtheria is reported increasingly prevalent in Newark, Paterson, Passaic and Summit.

NEW YORK.—Daniel Lewis, M. D., President, New York; B.T. Smelzer, M. D., Secretary, Albany.

The Secretary's *Bulletin* for September reports 500 fewer deaths than in the corresponding month of last year. Among zymotic diseases the only material difference from the mortality of September, 1895, is in diarrhoeal diseases, from which the number of deaths is less by 600; the mortality from all diseases of the digestive organs is diminished. Acute respiratory diseases caused 150 more deaths, and from diseases of the circulatory system there were 100 more deaths than a year ago; from other local diseases, as also from consumption and constitutional diseases, there was no material variation. There were 800 fewer deaths under five years of age. Compared with the preceding month of August, the total reported mortality is decreased by 3,000, the deaths under five years of age being fewer by 1,200. Among zymotic diseases, the diarrhoeal mortality was not half as large. Typhoid fever, malarial diseases and diphtheria show an increase; whooping cough, a decrease. Acute respiratory diseases have in creased; all other local diseases diminished, and the deaths from accidents and violence, under which was placed last month a large number from sun stroke, have fallen to the normal. The death rate from all causes is 17.50, against 23.25 in August and 18.50 in September last. The percentage of infant and zymotic mortality are respectively 36.0 and 19.75,

against 49.0 and 24.65 in August, and 41.5 and 25.00 in September last. The September prevalence of typhoid fever is excessive in the Hudson and Mohawk valley districts and in the southern tier and east central districts; the percentage of deaths from typhoid fever in urban parts of the State was 2.00; in rural parts of the State, 3.66. Diphtheria increased a little from August, but caused fewer deaths than in September of any year for ten years; in cities and villages it caused 3.50 per cent. of the deaths; in rural parts of the State, 1.57 per cent. Scarlet fever continues to cause few deaths, but is more widely distributed than in August. The mean temperature, average 61° for the month, was 2° below the normal, rain-fall was deficient in the eastern part of the State and excessive in the western; westerly winds prevailed.

The State Board has rendered its annual judgment on the Newtown Creek nuisance. Everybody who has had occasion to pass within a half mile of the creek has been disgusted with it for more than twenty years. It became one of the first subjects for the exercise of the olfactory nerves of the State Board of Health during the first year of the Board's existence (1880-81), and the board has continued to smell it, and has *resolved upon* its abatement annually. The Governor's power to abate the nuisance—known to be abundantly sufficient—has been several times evoked. There is now pending a proclamation of Governor Morton, made soon after he came into office, nearly two years ago, that it should be abated within sixty days. But the Governor did not know, nor, apparrently the new appointees of the State Board know, that the chief source of the foul odors of the creek was Brooklyn's sewage. The fouling of the creek was the deliberate work of Brooklyn officials. To change the course of and extend the sewers to the East river would involve much more time than sixty days, and considerable outlay. The proclamation has remained a dead letter.

No action has been taken by the Brooklyn authorities to abate the nuisance. It is added to somewhat by the drainage of several factories on the creek; and, so long as the public authorities maintain the chief source of offensive odors, there seems to be no good reason why war should be made upon them. But the recent action of the State Board is aptly illustrative of its ignorance of the primary source and history of the nuisance—which may be learned in great part by reference to the annual reports of the board—with which the present members appear to be unfamiliar; otherwise the board would not have deemed this action necessary: Dr. Doty

asked for a continuance of the committee that is investigating the Newtown Creek nuisances, and that the committee be permitted to engage the services of Dr. Ernest Lederle, chemist of the New York Board of Health, to assist them in their investigation of the Newtown Creek matter. The permission was granted. The committee will hold sessions and take evidence on both sides!

New York City, 1,995,000.—Report for September: Deaths, 3,059—1,311 under five years. Death rate, 18.66. Zymotic diseases, per 1,000, from all causes, 170.25; diphtheria, 105; typhoid fever, 38; consumption, 408; acute respiratory diseases, 370; diarrhoeal diseases, 277.

Early Diagnosis of Typhoid Fever. (Nov. 9th): The board issued a circular to physicians, inviting them to co-operate in conducting experiments which will assist in diagnosing early or obscure cases of typhoid fever under the new laboratory method of mixing the blood of suspected patients with active cultures of typhoid bacillus.

Dr. Herman Biggs, Director of the Bacteriological Laboratory, reported to the board recently that the investigations of Pfeiffer, Widal and Johnson showed that blood thus mixed has the power of arresting the active movement of these bacilli and of producing peculiar and characteristic clumping of the organisms of disease. It has been shown, he says, that this reaction occurs frequently very early in the course of the disease, at a time when the physician by ordinary methods cannot determine certainly whether the patient is suffering from typhoid or some other form of fever. It is found throughout its course and very often for a considerable period after complete recovery. With the sanction of the Board of Health Dr. Biggs has arranged to make a daily collection of slides furnished by physicians from the druggists with whom diphtheria culture tubes are kept, and to promptly investigate and report upon them. It is believed that the scheme will be of vast assistance to the doctors of the city, and will greatly help them in promptly attacking typhoid fever in its incipient stage.

An Important Decision with Regard to Tenement Houses.—The New York Supreme Court has decided that a board of health is final authority in certain instances regarding the fitness of dwellings for occupancy. The soundness of this decision seems apparent in the face of the fact that in crowded parts of great cities the public safety depends often upon immediate action. It is better that real estate owners should obtain compensation through the slow processes of the law, than that the health or lives of the occu-

pants of houses should be endangered through lack of legal authority to act quickly and with effect.

Brooklyn, 1,100,000.—Report for September: Deaths, 1,661—749 under five years. Death rate, 18.12. From zymotic diseases, per 1,000, from all causes, 188.00; diphtheria, 73; typhoid fever, 25; consumption, 163; acute respiratory diseases, 139; diarrhoeal diseases, 152.

Diphtheria is increasingly prevalent, as usual at this season. By the latest weekly report, at the time of this writing, ending Nov. 14th, 89 cases with 36 deaths (including 6 "croup") were reported. The city is to be congratulated on the contract recently entered into by the Commissioners of City Works and Health with the Brooklyn Sanitary Company for the removal of garbage. The company proposes to dispose of the garbage under the Arnold system. It is simple, efficient and quick in its operation. The plant is at Barren Island. The objections to it, outside of local ones, are the effluent water discharged into the bay and a slight so-called chocolate color of the tankage. The effluent water is admitted to be thoroughly sterilized, and, therefore, that it is objectionable from a sanitary point of view is to our mind doubtful. It may, however, be deemed advisable that it should be stored and only allowed to flow into the bay on an ebb tide. The odor is in no way noxious and could be remedied by use of exhaust fans in the tank room. Both of these defects are capable of being easily remedied. The Board of Health of Philadelphia unanimously indorses the system as both efficient and sanitary, and not one complaint has been made against it. Colonel Waring, after a very careful investigation, approves of it, and the contract for the city of New York has been awarded to this system. The New York State Board of Health and the New York City Board of Health have both approved it.

Buffalo, 350,000.—Report for September: Deaths, 402—177 under five years. Death rate, 13.78. From zymotic diseases, per 1,000 deaths, from all causes, 332.50; diptheria, 19; acute respiratory diseases, 42; consumption, 26; diarrhoeal diseases, 73.

Rochester, 170,000.—Report for September: Deaths, 178—55 under five years. Death rate, 13.15. From zymotic diseases, per 1,000 deaths, from all causes, 150.00; consumption, 18; acute respiratory diseases, 10.

Albany, 100,000.—Report for September: Deaths, 155—38 under five years. Death rate, 18.60. From zymotic diseases, per 1,000 deaths, from all causes, 212.50; typhoid fever, 9.

Syracuse, 100,000.—Report for September: Deaths, 117—42 under five years. Death rate, 14.00. From zymotic diseases, per 1,000 deaths, from all causes, 275; consumption, 10; acute lung diseases, 11.

NORTH CAROLINA.—George G. Thomas, M. D., President, Salem; Richard H. Lewis, M. D., Secretary, Raleigh.

October bulletin summarizes reports from 26 towns, with aggregate populations of 84,272 white and 60,463 colored, for the month of September. Deaths, 81 white, 98 colored. Death rates, respectively: 11.5, 19.4; 14.8. The chief causes were: From diarrhoeal diseases, 21; consumption, 20; typhoid fever, 19; malarial fever, 11; pneumonia, 3.

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus.

Cincinnati, 350,000: J. W. Prendergast, M. D., Health Officer, reports for October: Deaths, 399—99 under five years of age. Death rate, 13.68 per 1,000. From diphtheria, 22; typhoid fever, 11; consumption, 54; pneumonia, 30.

Cleveland, 330,279: J. L. Hess, M. D., Health Officer, reports for October: Deaths, 386—175 under five years; from diphtheria, 41; typhoid fever, 6; consumption, 13; pneumonia, 35. Death rate, 13.76.

Toledo, 137,780: J. T. Woods, M. D., Health Officer, reports for October: Deaths, 138—39 under five years of age

October 15-November 10: *Diphtheria* reported prevalent in Iberia, Rome City, Delhi, Hilsboro, Newark, Enterprise, East Liverpool and Hamilton. *Typhoid fever* is prevalent in Middlepoint, Akron, New Straitsville and Wooster.

OREGON.—Portland (*Oregonian*), October 22: Diphtheria is prevalent in this city; also (October 29) in Springfield and Salem.

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

Philadelphia, 1,188,793: Theodore B. Stulb, Health Officer, reports for five weeks ending October 31: Deaths, 1,856—565 under five years of age. From diphtheria, 126; typhoid fever, 20; consumption, 225; pneumonia, 129.

November 13: The last weekly report of the Board of Health shows the existence of diphtheria in twenty-four of the wards of this city, the deaths for the week being 14 out of a total of 73 cases.

The Board of Health has issued a leaflet of general instructions, which is placed in the hands of all families where there are cases of diphtheria, for the purpose of preventing the spread of the disease. Among the precautions mentioned are the injunction to drink no milk or water which has been exposed to the air of the sick room; to handle no clothing which has beeen worn by the patient during sickness or convalescence, and to disinfect all such clothing by boiling, first soaking them in solutions of chloride of lime or carbolic acid and water. Where the articles of clothing can be spared they should be burned. The room occupied by the patient should be disinfected and cleaned, the paper removed from the walls and the furniture washed with a solution of carbolic acid.

Pittsburg, 280,000: Report for the five weeks ending October 31: Deaths, 377—143 under five years of age; typhoid fever, 12; consumption, 26; diphtheria, 18. Death rate, 13.9.

November 10: *Diphtheria* is reported increasingly prevalent in Braddock, Rankin, Rimersburg, Foxburg, Mauch Chunk, New Loudon, Minooke, Lykens, Mount Carmel, Allentown and Bristol. *Typhoid fever* continues prevalent in Scottsville, Roxbury, Reading and Bristol.

RHODE ISLAND.—A. G. Sprague, M. D., President, River Point; Gardner T. Swarts, M. D., Secretary, Providence.

October 15-November 2: *Diphtheria* reported prevalent in Crompton, Pawtuxet Valley and Ashton.

SOUTH CAROLINA.—*Charleston*, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M.D., Health Officer, reports for three weeks ending October 31: Deaths, 105—78 colored. Under five years of age, 24. Annual death rates—white, 16.09; colored, 37.24; 27.92.

TENNESSEE.—J. D. Plunkett, M. D., President, Nashville; J. Berrien Lindsley, M. D., Secretary, Nashville.

The Secretary's bulletin reports: The principal diseases, named in the order of their greater prevalence, in the State for the month of September were: Malarial fever, typhoid fever, acute lung diseases, diphtheria, consumption, whooping cough, scarlet fever, dysentery, measles, diarrhoea, chicken-pox, erysipelas, la grippe and rheumatism.

UTAH.—*Salt Lake City*, 48,076: W. T. Dalby, M. D., Health Commissioner, reports for October: Deaths, 34. From *typhoid fever*, 8; diphtheria, 2; cholera infantum, 5. Death rate, 9.25. Typhoid fever is also prevalent in Provo City.

VERMONT.—C. S. Caverly, M. D., President, Rutland; J. H. Hamilton, M. D., Secretary, Richford.

Montpelier, November 10: In response to invitations issued by the State Board of Health, about twenty health officers from various parts of the State gathered in the Supreme Court chambers at the State House and organized the *Vermont State Sanitary Association.*

Officers were elected as follows: President, Fletcher D. Proctor, of Proctor; Vice-President, Dr. H. D. Holton, of Brattleboro; Secretary, F. H. Crandall, of Burlington; Treasurer, Dr. A. C. Bailey, of Randolph. Executive Council—Dr. D. C. Noble (Middlebury), Dr. Lyman Rogers (Bennington), Dr. W. J. Aldrich (St. Johnsbury), Dr. H. A. Crandall (Burlington), Dr. R. C. Johnson (West Concord), Dr. J.N. Jenne (St. Albans), Dr. Rublee (Morrisville), Dr. J. H. Jones (Bradford), Dr. John M. Currier (Newport), Dr. W. M. Stearns (Rutland), Dr. A. B. Bisbee (Montpelier), Dr. E. H. Pettingill (Saxton's River), and Dr. L. M. Green (Bethel). The Executive Council organized by electing Dr. W. M. Stearns President and Dr. D. C. Noble Secretary.

The literary programme of the meeting included the following papers: "Some Santary Work Required," Dr. Henry D. Holton, of Brattleboro; "School Sanitation," Edwin F. Palmer, of Waterbury; "Infectious Diseases," Professor A. P. Grinnell, of Burlington; "Spontaneous Development of Contagious Diseases," Dr. D. C. Noble, Health Officer of Middlebury; "Importance of Thoroughness in Cleaning and Disinfecting After Contagious Diseases," Dr. J. H. Hamilton, of Richford; "The Modern Water Closet," Dr. W. J. Aldrich, Health Officer of St. Johnsbury; "Sanitary Progress," Sidney Smith, City Engineer of Rutland; "The Health Officer and His Duties," H. L. Stillson, Health Officer of Bennington; "How Shall the Health Officer Be Paid," Dr. C. S. Caverly, of Rutland.

WEST VIRGINIA.—W. P. Ewing, M. D., President, Charleston; N. B. Baker, M. D., Secretary, Martinsburg.

Sistersville (*Post*, Covington, Ky.), November 7: A bad epidemic of *diphtheria* prevails and no quarantine.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; U.O. B. Wingate, M. D., Secretary, Milwaukee.

Milwaukee, 260,000: Walter Kempster, M. D., Commissioner of Health, reports for September: Deaths, 289—128 under five

years of age. From *diphtheria*, 30; diarrhoeal diseases, 29; consumption, 20. Annual death rate, 13.34 per 1,000.

October 28: Diphtheria is increasingly prevalent in the city. It is also reported prevalent in Janesville, Sheboygan and Medford.

ONTARIO.—Blenheim (*News*), November 5: Dr. Bryce, Secretary of the Provincial Board of Health, has returned to Toronto from *St. Thomas*, where he has beeen investigating the outbreak of *diphtheria*. He found there had been considerable carelessness or marked ignorance of the Medical Health Act, and in a general way told them that unless some change was made in their methods towards stamping out the disease the end of the trouble was far off. The custom of permitting public funerals must cease, and hereafter patients must be isolated for twenty-one days. In cases of failure to comply with the act he recommended prosecution.

Toronto (*Mail*), November 5: *Diphtheria* is increasingly prevalent in this city and several districts in the Province. Here and there inquiry has revealed the fact that municipal councils, from motives of economy, have neglected to appoint a health officer; and further, that in some cases the duties of these officers, like their pay, is mostly nominal. The spread of the infection in almost every instance is due to lack of isolation of first cases and through members of the family attending the patients.

NOVA SCOTIA.—New Glasgow (*Leader*), November 2: *Typhoid fever* appears to be quite prevalent throughout the Province. In Amherst it is stated that whole families are ill, and several cases have proved fatal. The disease is also reported as raging at Advocate Harbour, Parrsboro and other places.

CUBA.—*Havana*, for the month of October: Deaths, 1,182; from yellow fever, 272; small-pox, 140; enteric fever, 48; pernicious fever, 16.

MORTALITY STATISTICS ABROAD FOR THE SECOND QUARTER, 1896.

Population, total mortality, annual death rate per 1,000, and deaths from measles, scarlatina, typhoid fever and diphtheria.

London, 4,435,955; 20,727; 18.5; 497; 218; 169; 676. Glasgow, 705,052; 3,273; 18.6; 250; 36; 41; 40. Liverpool, 632,512; 3,616; 22.9; 27; 54; 54; 36. Manchester, 529,561; 2,900; 21.9; 114;; 51; 25; 13. Birmingham, 501,241; 2,736; 21.8; 21; 24; 25; 61. Leeds, 402,449; 1,849; 18.4; 50; 20; 33; 12. Dublin,

349,594; 2,033; 32.3; 1; 33; 35; 12. Sheffield, 347,278; 1,753; 20.2; 62; 30; 37; 4. Belfast, 277,354; 1,472; 22.2; 40; 35; 48; 9; Edinburg, 276,514; 1,061; 15.0; 20; 12; 6; 15. Bristol, 230,623; 897; 15.1; 18; 12; 2; 7. Nottingham, 229,775; 951; 16.6; 56; 7; 13; —. Bradford, 228,809; 884; 15.5; 13; 11; 5; 2. Hull, 220,-844; 1,152; 20.4; 119; 3; 29; 10. Newcastle, 212,223; 973; 18.3; 19; 1; 6; 5. Salford, 210,707; 1,252; 23.8; 23; 30; 14; 10. Leicester, 198,659; 897; 18.1; 4; 16; 9; 10. Portsmouth, 178,-639; 839; 18.8; 69; 4; 13; 4. Cardiff, 162,699; 714; 16.9; 13; 10; 2; 15. Brighton, 120,499; 493; 15.5; 33; 1; 5; 2. Norwich, 108,630; 404; 14.9; 7; 1; 5; 2. Plymouth, 90,276; 427; 18.9; 11; 3; 2; 3. Amsterdam, 487,772; 1,998; 16.4; 52; 9; 2; 42; Rotterdam, 272,042; 1,150; 16.5; 20; 7; 7; 12. La Hague, 180,455; 859; 18.5; 43; 3; —; 6. Luxembourg, 19,762; 76; 15.4; 4. —; —; 1; —. Lyons, 438,077; 2,007; 18.3; 11; 9; 26; 7. Lille, 216,-276; 1,282; 23.3; 37.4; 5; 5. Le Havre, 119,470; 772; 25.8; 5; —; 16; 1. Reims, 105,408; 629; 23.9; 3; —; 1; 7. Nancy, 90,478; 488; 21.5; 1; 1; 36; 1. Pau, 33,111; 145; 17;5; 1; —; 1; —. Berlin, 1,-2,706; 15.7; 36; 7; 13; 12. Munich, 406,000; 2,211; 21.8; 3; 6; 4; 32. Leipzig, 403,461; 2,542; 25.2; 54; 15; 7; 38. Breslau, 367.769; 28.0; 24; 26; 1; 18. Cologne, 324,000; 2,070; 25.2; 73; 7; 4; 29. Dresden, 334,066; 1,646; 19.1; 15; 10; 2; 13. Francfort, 235,052; 883; 15.0; 8; 6; 1; 7. Magdebourg, 215,872; 1,344; 36.6; 34; 3; 9; 44. Dusseldorf, 179,685; 985; 21.9; 2; 4; 2; 17. Koenigsberg, 173,642; 1,390; 31.4; 1; 10; 20; 13. Nuremberg, 164,689; 788; 19.1; —; 5; 2; 11. Chemnitz, 163,562; 1,166; 27.9; 1; —;1; 14. Altona, 149,608; 616; 16.5; 17; 1; 3; 4. Breme, 143,834; 569; 15.8; 1; 2; 3; 8. Elberfeld, 140,716; 563; 16.0; 5; —; —; 8. Charlottenbourg, 138,931; 590; 17.0; 8; 5; 5; 3. Dantzig, 126,141; 753; 23.9; 4; 1; 4; 6. Halle, 118,040; 756; 25.6; —; 4; 1; 23. Brunswick, 116,277; 589; 20.3; —; —; 4; 7. Aix-la-Chapelle, 111,279; 680; 24.4; 3; —; 6; 6. Crefeld, 107,486; 551; 20.5; 33; 8; 2; 13. Essen, 98,218; 552; 22.5; 8; 9; 5; 7. Mannheim, 92,523; 493; 21.3; 5; —; 2; 8. Mayence, 77,529; 397; 20.5; 4; 3; 2; 2. Metz, 65,791; 252; 15.3; —; —; 4; —. Berne, 48,328; 178; 14.7; —; 1; —; 3. Bale, 78,860; 303; 15.4; 1; —; —; 5. Geneve, 80,111; 319; 15.9; —; 1; 1; 2. Lausanne, 36,619; 137; 15.0; 8; 1; 2; 1. Zurich, 126,497; 514; 16.3; 1; —; 5; 3. Chaux-de-Fonds, 31,173; 101; 13.0; —; 2; —; —. Vienna, 1,526,623; 7,263; 18.4; 85; 90; 25; 96. Prague, 364,632; 1,605; 17.6; 25; 15; 25; 9. Trieste, 161,886; 1,113; 27.5; 46; 17; 5; 33. Lemberg,

135,908; 858; 25.3; 4; 17; 5; 16. Gratz, 119,413; 703; 23.5; —; 5; 1; 9. Brunn, 100,210; 620; 24.7; 1; 27; 11; 5. Gracovie, 80,310; 621; 30.9; 11; 15; 9; 2. Pilsen, 55,685; 292; 21.0; —; 1; 1; 3. Linz, 50,689; 332; 36.2; —; 6; 6; 3. Copenhague, 333,714; 1,376; 16.5; 1; 4; 8; 23. Stockholm, 267,100; 1,105; 16.5; 4; 8; 7; 6. Gothembourg, 114,512; 394; 13.8; —; 2; 10; 5. Christiania, 174,717; 994; 21.8; 27; 1; 10; 4. St. Petersbourg, 954,400; 6,603; 27.3; 96; 172; 319; 209. Moscow, 753,469; 8,701; 46.6; 117; 88; 93; 133. Warsaw, 553,643; 3,895; 28.1; 142; 217; 38; 54. Bucharest, 232,009; 1,619; 27.9; 9; 9; 13; 19. Brussels and suburbs, 518,387; 2,209; 17.0; 73; 3; 34; 6.

CHOLERA.—During the three months ending June 30th the mortality from cholera abroad is reported as follows: Rouen, 1; Cairo, 831; Alexandria, 589; Damiette, 24; Suez and Ismailia, 9; Port Said, 1; Bombay, 160.

DRUNKENNESS.—Approximately, in consequence of the drinking habit which so generally obtains in the United States, a million of men are impaired in their capacity for and skill in their work; 200,000, with their families, are in constant despair, and 100,000 die annually.

BLACK DEATH.—Kitasato has ascertained that the "black death" is due to a bacillus which causes a septicaemia attacking the lymphatic system, the spleen, and might therefore easily be confounded with anthrax. The bacillus is rounded at the ends, colors with the usual aniline dyes, more deeply stains at the end than in the middle, may be found in the blood, occurs in man, mice, rats and swine, and may be contracted by eating the diseased flesh of such animals.

MORTALITY ON THE WEST COAST OF AFRICA.—A member of the British Institute, J. R. Hart, last month published in the London Ins. Record some crude and imperfect statistics which had come into his hands relative to the deaths among government officials employed on the West Coast of Africa, which he sums up as follows:

The total number of years of life was 1,031½, and dividing the 54 deaths by these, we get an average rate or 5.2 per cent. I understand that colonial servants are not sent out to West Africa under the age of 22; and if we compare this rate with the mortality of the English population between that age and 50, showing an annual mortality of about 1.2 per cent., we arrive at an extra of 4 per cent.

Among the 138 persons who were employed only at the Gold Coast, the mortality was 6.2 per cent., while the 44 who served only in Sierra Leone exhibited a rate of 5.2 per cent.

It is obvious from these figures, which are largely confirmatory of other observations, that a death rate nearly five times the normal would make such residence almost prohibitory from an insurance standpoint.

GLOBE STATISTICS.

A new computation of the population of the globe has recently been made by the French statistician and savant, P. D'Amfreville, says the Literary Digest. He figured out a total of about 1,480,000,000, distributed as follows: Asia, with 825,954,000; Europe, with 357,379,000; Africa, with 163,933,000; America, with 121,713,000; Oceanica and the Polar regions, with 7,500,400; Australia,, with 3,230,000; or a grand total of 1,479,729,000 souls.

In connection with these data the English statistician, Schooling, makes some interesting comments. He states that of every 1,000 inhabitants of the globe, 558 live in Asia, 242 in Europe, 111 in Africa, 82 in America, 5 in Oceanica and the Polar regions, and only 2 in Australia. It then appears that Asia contains more than one-half of the total population of the earth, and Europe nearly one-fourth. Africa contains only one-ninth, and America only one-twelfth. In Australia the entire population is less than the number of inhabitants in the city of London alone or in the cities of Paris and St. Petersburg combined.

In Europe the number of inhabitants to the square mile is 95, in Asia it is 48, in Africa it is 15, in America it is 8, in Oceanica and the Polar regions it is 3, in Australia only 1. Accordingly, Europe contains for each of its inhabitants 2.8 hectares of land; Asia, 5.2 hectares; Africa, 17.6 hectares; Oceanica and the polar regions, 84.0 hectares; America, 31.2 hectares; Australia, 235.6 hectares. (A hectare is equal to 2,741 acres.)

The yearly increase of population on the globe is about 5 to every 1,000. At this ratio the population of the earth would be doubled every 139 years.

Of every 1,000 Europeans, 262 are subjects of Russia, 139 of Germany, 116 are Austro-Hungarians, 107 French, 106 English, 84 Italians, 48 Spanish, 17 Belgians, and 121 of the minor countries.

In reference to the density of population, Belgium takes the lead with 546 to a square mile, followed by England with 312, Italy with

263, Germany with 237, France with 184, Austro-Hungary with 171, Spain with 90, Russia with 49. The average of all the other countries is 47 to a square mile, and the average for all Europe is 96.

In Asia the 826,000,000 are distributed in the following manner: China takes the lead with 350 millions, British India with 278 millions, Japan with 40, East Indian Islands with 39½, French possessions in India with 19, Corea with 10½, English Burmah with 7½, Persia with 7½, Asiatic Russia and Turkestan with 7½, Siberia with 4½, Afghanistan with 4, Ceylon with 3, Arabia with 2½, all other parts of Asia with 43½ millions.

Of every 1,000 Asiatics, 424 are Chinese, 337 are Hindus (subjects of England), 48 are Japanese, 48 are Indian Islanders, including 23 in the French possessions, 13 are Coreans, 11 are Siamese, 9 are Burmans, 9 are Persians, 9 are Russians, 5 are Siberians, 5 are Afghans, 4 are Singhalese, 3 are Arabs, and 52 belong to smaller nationalities.

THE INCREASE OF ENGLISH-SPEAKING PEOPLE is one of the notable phenomena of this century. At present they are estimated to increase about 2,000,000 annually, and we have seen the whole number stated at 115,000,000, which we think is a low figure, as the 70,000,000 in the United States are about half that number, leaving Canada, Great Britain, Australia, New Zealand, and the other immense British possessions in the world to make up the balance. What is the connection between these facts and the spread of life insurance, which practically began with this century and has seen its greatest development in its last half? It was practically at zero in 1800; it exceeds thirteen thousand million dollars in the United States alone to-day!

THE RATIO OF PHYSICIANS TO POPULATION.—According to recent estimates, in the United States one to every 500; England, France and Germany, respectively, one to every 1,500, 1,800 and 3,000; Russia, one to every 6,000.

DR. HAMILTON'S RESIGNATION.

CHICAGO, October 14th.—John B. Hamilton, the United States Marine Hospital Surgeon stationed at Chicago, has wired a peremptory resignation to President Cleveland. Some time ago Dr. Hamilton was ordered to the Marine Hospital at San Francisco. He objected to being transferred, and made an official protest. This protest was overruled, and Dr. Hamilton was notified that he

must proceed to San Francisco forthwith. He then decided to retire from the service.

"The whole thing was worked by Surgeon-General Wyman," said Dr. Hamilton to-day. "I have been literally driven out of the service, and my retirement is doubtless just what Wyman desires. When I resigned as Surgeon-General to become hospital surgeon, Wyman became my successor, partly through my efforts, and his present endeavors to oust me from the Marine Hospital here is more than I can stand. I will not go to San Francisco under any circumstances."

Surgeon-General Wyman, when shown the above dispatch, declined to reply to the strictures of Dr. Hamilton, saying that the transfer was ordered simply in accordance with the regular custom of the service. It appears that the stations of surgeons are changed every four years. Dr. Hamilton, when ordered to San Francisco, had already served five years and three months at Chicago. On receiving notice of his transfer, August 25th, he protested to the Secretary of the Treasury, but his protest was overruled. Subsequently, through his attorney, he asked that the order be revoked, but the Secretary, after reviewing the facts, declined to interfere, and the order stood. Thereupon, as stated in the above dispatch, he tendered his resignation to the President. Dr. Hamilton is editor of a medical journal in Chicago, and is also a professor at Rush College there. There is little doubt that the President will accept his resignation.—*Associated Press Report.*

How highly favored Dr. Hamilton has been is known to the whole medical profession. His career as Surgeon-General of the Marine Hospital Service, his success in opposing and finally supplanting the whilom National Board of Health, and his antiquated method of dealing with yellow fever and cholera, all our readers are familiar with. Nevertheless, he has been the genius of the Marine Hospital Service. The service has been elaborated and rendered available as a national health service on his lines, but he has outrun them. His skill in this direction was but a small measure of his talents, on account of which other honorable and lucrative duties opened up before him. And of these he has availed himself with no less signal success than that of building up the Marine Hospital Service. That he has meanwhile retained his office and its emoluments as long as practicable, while making headway in a more lucrative field of usefulness, is hardly blamable, however unseemly his complaint against a denial of a longer continuance of the privilege.

That Dr. Hamilton now favors a national health service independent of, or a service so organized that it would subordinate, the Marine Hospital Service, is perfectly consistent with his duty. Otherwise he would be disloyal to the American Medical Association, whose journal he edits. But that his advocacy in this regard has had any influence with Surgeon-General Wyman in the exercise of his duty nobody will believe who knows Dr. Wyman.

Dr. R. RUTHERFORD, of Houston, we learn from Texas *Medical News*, was recently remembered by a grateful patient, who provided $25,000 for him in her will. We congratulate the doctor, and trust that grateful patients will be more numerous in the future.

CONTEMPORARY LITERATURE.

THE EVOLUTION OF NATURAL RIGHTS.

A hundred and twenty years ago the doctrine of natural rights was set forth by the American Congress. No dictum is more familiar to Americans, none so popular. America was the first nation to make it a fundamental article of political faith—expressed in classic form in the Virginia Resolutions and in the Declaration of Independence. But neither George Mason, the author of the one, nor Thomas Jefferson, the author of the other, nor any of their associates or contemporaries, understood the doctrine as it is understood to-day. To them it was the fundamental doctrine of individualism. To-day it is the fundamental doctrine of communal rights. To Jefferson and his contemporaries the Declaration conveyed the idea of the enfranchised individual. No other was understood. Nor was the idea formulated only in a general way in a State paper; it was applied and defined elaborately in the twenty-three constitutions which the American commonwealths adopted in the eighteenth century, and was worked out in their legislation and in civil administration. In none of these constitutions or laws is there a hint of the State or the Nation, as these terms are now understood. Mason's sixteen resolutions are the classic constitutional as Jefferson's Declaration is the classic political statement of the doctrine, and with slight additions, Mason's thought is set forth in the one hundred commonwealth constitutions adopted in this century, and also in the first ten amendments to the Constitution of the United

States.—From "The Dominant Idea of American Democracy," by Professor FRANCIS N. THORPE, in *Harper's Magazine* for November.

A PUBLIC GYMNASIUM.—The commissioners in charge of the park system of West Chicago are going in for a number of innovations that are sure to be appreciated by the public. They include a bicycle race-track, a gymnasium, and a natatorium. The last two institutions have just been dedicated to the public. The natatorium provides accommodations for several hundred bathers, with separate pools for men and women, and all the necessary appliances will be furnished without charge. The gymnasium is combined with a quarter-mile running track, and is essentially an out-door affair, provided with apparatus in great variety. Both these institutions are situated in the part of Chicago that lies well away from Lake Michigan, and is consequently most in need of such accommodations. It would be well for the park authorities of other large cities to follow this admirable example, and make their municipal pleasure grounds thus minister in the widest sense to the physical needs of the poorer classes. There is no wiser form of public expenditure, and none that will bring a larger return from a given investment.—*Harper's Weekly.*

AN ENGLISH VIEW OF THE AMERICAN CLIMATE.—We learn a great many interesting things about America from the London newspapers. Here is the latest bit of information that has come to hand:

"Mr. Willie Park, Jr., the well-known golfer, who recently returned from a visit to America, tells of a match he played there with Willie Dunn under exceptional circumstances. It was the time of the great heat wave in New York, and on the day on which the match was decided, the heat Mr. Park describes as being 'somewhat terrible.' The thermometer registered 101 degrees in the shade. Notwithstanding this there was a large following, many of whom sought to overcome the effects of the heat by bathing their heads under running-water taps on different parts of the course. It was almost impossible to keep the balls in a playable condition, as the heat softened the gutta-percha. To prevent them melting they were placed on ice and carried along by a caddie, who deposited a changed ball at each tee, while the old ones were replaced on the ice for preservation!"—From *Harper's Round Table.*

WHAT THE AMERICAN COLLEGE HAS DONE.—The American college has possibly done more in laying foundations for culture than in directly cherishing culture; for the American college has been so deeply concerned with the primary disciplines that it has found little opportunity for affording to its students means and methods of the deepest enrichment. But it has given impulses; it has awakened aspirations; it has put before the student standards of taste; it has trained intellectual judgment; it has given to the great law of right a new value by showing the breadth of its application and the height of its reach; it has sought to create a refinement which is purchased neither by the elimination of robustness nor by the introduction of over-critical aestheticism; it has tried to train each man to love the best in literature, in music, in painting, in nature, in humanity; and it has striven constantly to cause the student to distinguish in everything, not simply the good from the bad, but, what is far more difficult, the better from the best.

This service of the American college in training men to live intellectual lives is of the greatest worth to this country and to this age. For, in this age and country of materialism, the college should minister to the things of the mind. The college should not directly attempt to stem the tide of materialism. The attempt would be useless. But the college may worthily hope to transmute the capacity for this material enthusiasm, even if not the enthusiasm itself, into a capacity for holding and delighting in relations which are eternal, spiritual and ethical.—From "Influence of the College in American Life," by President CHARLES F. THWING, D. D., LL. D., Western Reserve University and Adelbert College, in *North American Review* for November.

"MULBERRY BEND."—As to the moral status of the streets west and north of Chinatown, I need scarcely do more than mention that these are Mulberry, Baxter and Bayard, and that within a stone's throw of Mott street is the notorious "Mulberry Bend," for many years past the hiding place of criminals, and the last and lowest resort of the abandoned and vicious of both sexes. The tales of "Mulberry Bend" that until recently assailed the ears of the missionary are absolutely unrelatable, and to be comprehended only by one used to the sight and knowledge of the lives of criminals and outcasts of the lowest possible character. Within the last few years the police have driven out the worst dives of the region, but the evil effects of those once-abounding evils are still to be seen

there, and unfortunately tell sadly upon the Italians, who have filled up the quarter. — "The Chinese of New York," by HELEN F. CLARK, in the November *Century*.

A SAND-STORM OF THE AMERICAN DESERT.—That the "Great American Desert" still exists, in spite of strenuous efforts on the part of certain politicians, railroad corporations, and other interested parties to obliterate it from the maps, is a fact only too well known to many thousands of disappointed settlers, army people, prospectors and travellers over several lines of railway. Most especially is it in evidence on the route of the Southern Pacific road, which traverses its desolation for hundreds of miles, and whose tank cars for the transportation of water form an important item of equipment. It is true that portions of its unproductive lands are irrigable (at a vast expense), and may thus in the distant future be reclaimed to the uses of agriculture. At the same time, it is equally true that wide areas lie so remote from revivifying influences that, unless subjected to radical climatic changes, they must always remain desolate, wind-blown wastes, exhibiting the characteristics and phenomena of all deserts existing under similar conditions.

With a thunderous roar the sand-storm hurls itself upon its victims, driving them before it with irresistible fury. No animate form may oppose it and live, but man or beast so ill-fated as to be caught within its dread radius must submit to be driven forward like an autumn leaf, blinded, choked, and sorely lashed, until some sheltering lee is reached or the fury of the storm is exhausted. If he stumbles and falls or sinks through weakness, he is lost, and the skeletons of former victims are stripped of their heaped covering to furnish him a sepulchre.

Although the sand-storm is generally of short duration, it sometimes lasts for hours, and has been known to rage for days with unabated fury. While thus exercising its evil powers it destroys life and changes the whole aspect of the country over which it sweeps, moving hills and valleys to new positions, filling dry water courses, burying the little oases nourished by infrequent springs, and obliterating trails. In the old days of slow-moving wagon trains it was a menace and a calamity, while even in this era of railroads it brings distress and peril to the traveller. It fills the most carefully protected cars with its stifling dust, blocks the track with heavy drifts, cuts down telegraph poles with its rasp of flinty particles, grinds clear glass into opaqueness, and in a thousand ways renders life miserable and a burden.—*Harper's Weekly*.

THE TRUE MORAL STANDARD.—The moral motive, therefore, arises not by contemplation of the gratification given by a certain line of conduct to God, or by recollection of superimposed pleasures, secular or supernatural, present or future; or by any reference to the social habits or conventions with which the said line of conduct may or may not accord. Such moral motive has nothing to do with obedience to the revealed will of God, or with the extraneaus conceptions of heaven and hell, or with punishment or reward from earthly rulers, or with the favor or disfavor of public opinion. It arises from the vivid ideal representation of the relation between action and life. The compulsion of morality, therefore, is inner and not outer compulsion, its authority inner and not outer authority, its restraints those arising from the connection of cause and effect, its sanctions natural, not supernatural, essential and not fortuitous. The foundations of the moral code thus belong to the very nature of sentient life itself, and its dictates therefore possess a validity, a reach, a significance, a sacredness, to which no others can conceivably lay claim.—Professor W. H. HUDSON, in Appleton's *Popular Science Monthly* for November.

The *Review of Reviews* for November publishes several important and interesting articles on the latest phases of the Eastern question, especially from the British point of view. Mr. W. T. Stead's survey of the subject, entitled "The Eastern Ogre; or, St. George to the Rescue," is extremely characteristic and suggestive; the *Review* also offers a remarkable symposium of current thought on "What Should be Done with Turkey?" as the pressing problem of the hour.

"The Progress of the World," in this number, is largely devoted to the political situation, but also furnishes a convenient summary of the latest developments of the Turkish question and other problems in international relations.

STREET PAVING AND CLEANING IN BIRMINGHAM.—Most of the 257 miles of streets are paved with macadam varying from 6 to 18 inches in depth. It is well adapted for the less crowded residence districts, although somewhat costly to maintain. In the business quarter stone blocks are used, their average life being twenty-five years. This is done by the Public Works Committee, with laborers working by the day or week. Other streets in the same quarter are paved with wood blocks, insuring greater freedom from noise and more cleanliness. This is laid by contract, and is supposed to

have an average life of fourteen years. Whatever material is used, the streets are kept in the best repair. Street-cleaning gangs meet in the business quarter at five o'clock each morning, sweep up and cart away the accumulated dirt, and water the streets before and after the operation, until those laid with wood looked as if they had been carefully scrubbed. They are also kept clear of litter during the day. In residence districts they are swept once, twice, or three times a week, as required. As a result they are everywhere kept so clean as to cause surprise. It cannot, however, be said that the footpaths are so well kept, the practice of every man sweeping before his own door not being common, except for the removal of snow.—"An Object Lesson in Municipal Government," by GEORGE F. PARKER, in the November *Century*.

IMMIGRATION AND CRIME.—In the *American Journal of Sociology* for November, Mr. H. H. HART, General Secretary of the National Conference of Charities and Corrections, has an important statistical study in which he has attempted to prove that injustice has been done to our foreign-born population by accepted interpretations of criminal statistics. His claims are summed up as follows:

In the present article it will be shown (*a*) That, as a matter of fact, the foreign-born population furnishes only two-thirds as many criminals in proportion as the native born; (*b*) that while it is true that the native-born children of foreign-born parents as a whole furnish more criminals proportionately than those whose parents are native born, yet in more than half of the States the showing is in favor of the children of the foreign born; (*c*) that the combined ratio of prisoners of foreign birth and those born of foreign-born parents to the same classes in the community at large is only 84 per cent. of the ratio of native born prisoners to the same class in the community at large.—*University of Chicago Press.*

"SETTING THE RIVER ON FIRE."—Sometimes, when a person wants to make an unpleasant remark in a pleasant sort of way about a dull boy, he will say, "That boy will never set the river on fire." Now, that is all very true; for even the smartest man in the world could never set a stream of water on fire, and so perhaps many of you who have heard this expression have wondered what is meant by setting the river on fire.

In England, many, many years ago, before the millers had machinery for sifting flour, each family was obliged to sift its own

flour. For doing this it was necessary to use a sieve, called a temse, which was so fixed that it could be turned round and round in the top of a barrel. If it was turned too fast the friction would sometimes cause it to catch fire; and as it was only the smart, hard-working boys who could make it go so fast as that, people got into the way of pointing out a lazy boy by saying that he would never set a temse on fire. After a while these sieves went out of use, but as there were still plenty of stupid boys in the world, people kept on saying that they would never set the temse on fire. Now, the name of the River Thames is pronounced exactly like the word "temse;"and so, after many years, those persons who had never seen or heard of the old-fashioned sieve thought that " setting the temse on fire " meant setting the River Thames on fire. This expression became very popular and travelled far and wide, until the people living near other streams did not see why it was any harder for a slothful boy to set the Thames on fire than any other river, and so the name of the river was dropped, and every body after that simply said " the river," meaning the river of his particular city or town; and that is how it is that people to-day talk of setting the river on fire.—*St. Nicholas* for November.

SIR BENJAMIN WARD RICHARDSON DEAD!

Such is the cablegram announcement at the time of closing this number.

LONDON, November 21.—Sir BENJAMIN WARD RICHARDSON, M. D., F. R. S., etc., honorary physician to the Royal Literary Fund, the Newspaper Press Fund and the National Society of Schoolmasters, is dead. He was born in 1828, was made an honorary member of the Philosophical Society of America in 1863, and was a member of a number of other prominent societies. He has been President of the Medical Society of London, and was thirty-two times President of the St. Andrew's Medical Graduates' Association. He succeeded Lord Jerviswoods in 1869 as Assessor for the General Council in the University Court of St. Andrews, and held that office for nearly sixteen years.

Besides devoting much time to literary labors, in addition to his professional work, Dr. Richardson took an active interest in the development of bicycling, and was President of the Society of Cyclists. He was knighted in 1893.

Benjamin Ward Richardson was in the front rank of progressive sanitarians..

BOOKS, PAMPHLETS, ETC., RECEIVED.

The Non-Heredity of Inebriety. Leslie E. Keeley, M. D., LL. D, Chicago.

Proceedings of the Florida Medical Association, 1896.

Physician's Visiting List. P. Blakiston, Son & Co., Philadelphia.

Anaesthesia. William Wood & Co., New York.

Baths, Bathing and Swimming for Soldiers. H. Lincoln Chase, M. D., Brookline, Mass.

Diagnosis of Tuberculosis from the Morphology of the Blood. A. M. Holmes, M. D., Denver, Col.

Rheumatic Irritis. A. Britton Daynard, M. D., New York.

Tuberculosis Investigations. Dr. D. E. Salmon, Bureau of Animal Industry, Washington, D. C.

Treatment of Phthisis in Sanitaria Near Our Homes. Vincent Y. Bowditch, M. D., Boston, Mass.

Notes on Inguino-Scrotal Cysts. Thomas H. Manley, M. D., New York.

Inguinal and Scrotal Cysts. Ibid.

Competition of the Sexes and Its Results. Lawrence Irwell, M. A., B. C. L., Buffalo, N. Y.

Tears of the Rectum in Abdominal Operations for Pyosalpinx and Their Treatment. Hunter Robb, M. D., Cleveland, O.

Causes and Mechanism of Retropleyion and Retroversion of the Uterus. Ibid.

Clinical Experience with Gold Solutions. Eustathius Chancellor, St. Louis, Mo.

Scientific Importance of Vital Statistics. U. O. B. Wingate, M. D., Milwaukee, Wis.

Memoirs of Edward Jenner. Horatio R. Stoner, M. D., Newport, R. I.

Tuberculosis—Management and Treatment of, in Asheville, N. C. James A. Burroughs, M. D., Asheville, N. C.

Sero-Therapy in Tuberculosis. Paul Paquin, M. D., St. Louis, Mo.

Some Meteorological Data. Samuel A. Fisk, A. M., M. D., Denver, Col.

" News, Old News." Ibid.

Relative Merits of Total or Partial Vaginal Hysterectomy for Cancer of the Cervex by Ordinary Methods, and Supra Vaginal Excision by Galvano-Cautery. John Byrne, M. D., LL. D., Brooklyn, N. Y.

Dermatological Notes. H. R. Morton, M. D., Brooklyn, N. Y.

Aerial Transportation of Malarial Germs. Ibid.

What Shall be Done for the Teeth of the Poor ? Richard C. Newton, M D., Montclair, N. J.

Clinical Notes on Methods and New Remedies in the Treatment of the Upper Air Passages. Walter F. Chappel, M. D., M. R. C. S., New York.

Microscopical Proof of a Curative Process in Tuberculosis. Charles Denison, A. M., M. D., Denver, Col.

Practical Points Regarding Albuminaria. David Inglis, M. D., Detroit, Mich.

Surgical Treatment of Head Injuries. F. G. Winter, M. D., Brooklyn, N. Y.

Drainage vs. Radical Operation in the Treatment of Large Pelvic Abscesses. Charles P. Noble, M. D., Chicago.

Suspensio Uteri with Reference to Its Onfluence Upon Pregnancy and Labor. Ibid.

A New Operation for Certain Cases of Procedentia Uteri. Ibid.

Report of Kensington Hospital for Women. Ibid.

Subphrenic Abscess. Carl Beck, M. D. New York.

The Fallacy of Antitoxin Treatment as a Cure for Dipththeria. Elmer Lee, M. D. Chicago, Ill.

How to Cure Rheumatism. Ibid.

A Critical Analysis of Dr. Winters' Clinical Observations on the Antitoxin Treatment of Dipththeria. John Winters Brannan, M. D. New York.

Comparative Study of the Ophthalmoscopic Conditions seen in Interstitial Nephritis. Charles A. Oliver, M. D. Philadelphia.

Chancres Found in Unusual Localities. E. Harrison Griffin, M. D. New York.

Rapid Dilatation of the Os Uteri and Delivery. Harrison Willis, M. D. Brooklyn, N. Y.

State Care and State Maintenance for the Dependent Insane in the State of New York. Carlos F. MacDonald, M. D. New York.

Abortion; Its most Frequent Cause. Geo. Troup Maxwell, M. D. Jacksonville, Fla.

The Fin-de-Siecle Treatment of Abortion. Edward E. Conrad, M. D. New York.

Hydro-Galvanism of the Urethra. Robert Newman, M. D. New York.

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The Prostrate; Some of its Acute and Chronic Conditions and their Treatment. L. Bolton Bangs, M. D. New York.

Tapeworms of Poultry. Dr. D. E. Salmon, Chief of the Bureau of Animal Industry. Washington, D. C.

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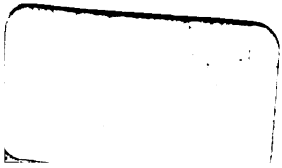

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